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How two unique buildings for the naval observatory at Washington were welded—soon

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Longer Lasting Steel

DEEP in the earth or towering in the sky—steel serves mankind in ten thousand ways. More important, the service which steel renders is constantly improving.

For example, Granite City Copper Bearing Steel —rust-resisting, corrosion-resisting—lasts three times as long as ordinary steel. Reducing depreciation, eliminating frequent repairs, this improved steel is available in sheets and plates for practically every use.

And Granite City service matches the quality of this superior steel. Made at Granite City, Illinois, only 15 minutes from Saint Louis—served by 29 railroads and the Mississippi River—better service is assured to the Mississippi Valley, the west and the southwest.

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Volume 92 Number 19

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

MUCH the same spirit that moved a Revolutionary leader to admonish, "Fear God but keep your powder dry," is actuating the iron and steel industry today. With an apprehensive eye it is following every move of the administration at Washington that is calculated to raise commodity prices and increase employment, yet the natural course of events is sweeping the industry on to the achievement of these very objectives.

35 Per Cent, Black Ink for Some Mills, Near

A rise of 4 points puts the steelmaking rate up to 33 per cent, highest in 21 months, with 35 per cent probable this week; a runaway market in scrap has lifted some grades $1.50 per ton; consumers, especially automotive, are rushing to cover in anticipation of an advance for the third quarter; iron ore shipments up 88 per cent over a year ago; a possible rise in the tin plate price for the second half—such is the week's market news (p. 41).

May Not Need Roosevelt Salvage Crew

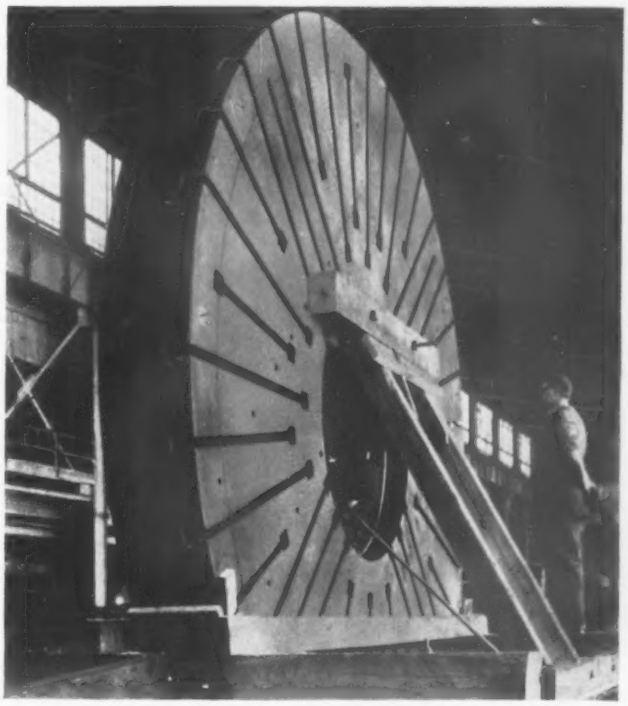
This quickening of the iron and steel industry, which is both putting men at work and stimulating higher prices, tends to make the Roosevelt program for control of industry more elastic (p. 11). Almost hourly, as the industrial picture changes, chiefly for the better, the necessity for control lessens. But the President is not likely to permit congress to adjourn without granting him permissive authority to govern industry in case of reversal of the present improvement.

Shape Orders Forge Ahead of 1932

With the exception of railroads, where the stirring is feeble, and pipelines, which await financing, every major outlet for steel is broader. . . . Automobile production is 60 per cent of normal (p. 17); a June output equal to May, or about 200,000 units, is forecast. . . . Award of 144,128 tons for the San Francisco-Oakland bridge (p. 48) puts 1933 structural orders 15 per cent ahead of 1932. . . . Stronger in all districts, scrap (p. 52) has virtually become an hour-to-hour market. . . . April's daily rate of pig iron production—20,770 tons—was an increase of 18.7 per cent over March and the best since last November (p. 16). With 10 more stacks active, a brisk May is assured.

No Bottom to Mesabi Range for Generations

Nor is there any danger that any conceivable measure of improvement will exhaust the supply of Mesabi iron ore for blast furnaces in the Great Lakes district. An authoritative statement (p. 13) by a Minnesota state expert maintains that with better mining and con-



This giant pipe boring and facing machine, with turning arm 33 feet long, was built by Mesta Machine Co., Pittsburgh, for machining ends of penstocks at Hoover dam. Penstocks are in sections of 6 plates, 2⅞-inches thick, 96 feet in circumference, weighing 150 tons

centrating methods what is now regarded as inferior ore can be economically utilized for generations. . . . Some of this Mesabi supply may find an enlarged market with the virtual completion of the Illinois waterway (p. 19), which also enables Chicago finished steel to compete better in the Southwest with Pittsburgh and Wheeling mills.

The "New Deal" in Metals

Nothing commands attention today like alloys. At a recent meeting in New York on stainless steels more than 850 listened spellbound to a discussion of the development, applications and probable future of the chrome-nickel series (p. 30), while over 1500 inspected the stainless steel products of some 50 manufacturers. . . . One new use of stainless steel is in a beer cooler (p. 35) which employs 24-foot lengths of 2⅜-inch electric welded stainless tubing. Stainless steel sheets are used in the construction of a 3000-gallon transport tank for a Chicago brewery.

Steel "Can Take It" from Beer or Milk

But 3 per cent milk is on just as friendly terms with alloys as 3.2 per cent beer. An alloy of nickel, chromium and iron, recently developed for dairy equipment exposed to lactic acid and brine, has been found (p. 30) almost entirely proof against staining and corrosion from atmospheric conditions. This alloy is also used for household screens. . . . A newly-developed bronze containing 96 per cent copper, 3 per cent silicon and 1 per cent zinc is suitable (p. 28) for structural applications because of its high tensile strength, hardness and resistance to corrosion from chemicals. . . . Chemical handling equipment is made (p. 30) from an alloy entirely resistant to hydrochloric acid and temperatures up to the boiling point.

Insulate Carbon Steel from Beer

Carbon steel as well as the chrome-nickel alloys has been stimulated by the return of beer. A Milwaukee fabricator of automobile frames and line pipe has turned to the production of beer barrels (p. 26) from medium-high-carbon steel, lined with a special composition which does not affect the taste, color or odor of its contents. . . . These barrels, which are all-welded, fulfill in part the hope of a speaker at the recent meeting of the American Welding society in New York (p. 26). Welding is a creative agency, he insists, and should develop an original consciousness, subordinating the tendency to regard it as merely a method of repair. This involves merchandising, development of new markets, extension of trade association activity.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Testing the "Goodness" of Iron Bars in 1761

The following letter has been transcribed from the original, reproduction of the beginning and end of which appears at the bottom of this column. The communication is from one of the chief engineers in the British Colonial army to Gen. Jeffery Amherst, commander-in-chief. The letter is reproduced by permission of the Earl of Amherst.

THE EDITORS

Sir:

New York
9th, Oct. 1761

I had the honour of Your Excellency's letter the day before yesterday of that date. I have acquainted Major Beckwith that you have been pleased to appoint Capt. Alt to our Reg't., and informed him. He was going to Bath in a bad state of Health.

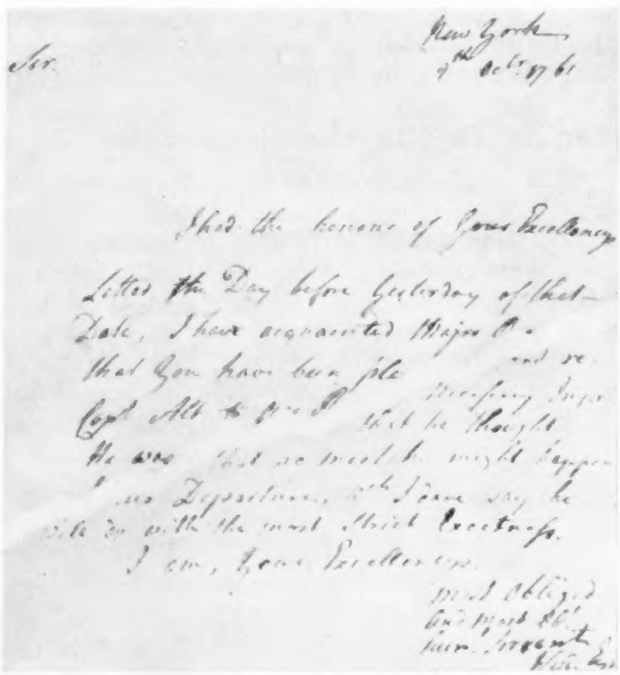
I have employed the Principal Black-Smiths in this city to make different Experiments to try the goodness and various properties of the Canadian Iron; that Bar which was longest, is found to be Extremely hard, tho' Malleable and easily Wrought for Several Purposes which Require hard iron, but what makes it most valuable is that I am informed it will make as good steel as any that goes under the name of what we call German Steel. The other Bar is more Malleable and fitter for all sort of works in General. The Smiths tell me that it is better than Any made in this Country, and even Exceed that imported from Sweden. In Short, they Say it's as good as ever they Saw in their Lives.

I have acquainted Capt. Gerth by the last Post, but one, that I was apprehensive that He would be soon called upon, and reminded him to give all the necessary information to Lt. Bonzele that he thought necessary, so that no mistake might happen after his Departure, wch I dare say he will do with the most strict Exactness.

I am, Your Excellency's Most Obliged and Obt.
Hum'l Servant,

WILL, ESQ.

His Excellency, Sr. Jeffery Amherst



U. S. PLAN FOR INDUSTRY IS TAKING FORM

REPRESENTATIVES of industry are thronging to the nation's capital in swarms reminiscent of the hectic war days of 1918. Even before the meeting of the United States chamber of commerce attracted thousands of business men to this city, industry's spokesmen to the number of hundreds were here to voice their opinion on proposed bills.

The magnet is the government's move to regulate industry. Just how regulation will be effected still is in doubt. On Capitol hill, certain senators and representatives still believe in the Black and Connery 30-hour bills. Madame Secretary Perkins still declares legislation for fixing hours of work and minimum wages is indispensable. But the administration's attitude is plastic. For three weeks it has been yielding to suggestions for improvement.

First, the administration announced its approval of the spreadwork feature of the Black bill, but when it recognized certain defects, it sponsored a series of substitute provisions suggested by Secretary Perkins. Later these seemed inadequate, and the administration set to work on a "national industry recovery act." In its initial form it provided for

1. Creation of a national board of seven members, including the secretaries of commerce and labor and representatives of the public, finance, industry, agriculture and labor, to administer the plan of industrial control.
2. Utilization of trade associations as the liaison agencies between government and industry. Each trade association would work closely with the national board in establishing prices, balancing production against demand, enforcing trade practices and determining wages and hours of labor.
3. Licensing individuals, corporations and associations agreeing to the terms of the act; to stipulated prices, quotas, etc., and to guaranteeing to employes the right of collective bargaining.
4. Powers, vested in the national board, to certify applications from industrial concerns for loans from the Reconstruction Finance Corp.

By midweek, the "recovery act" had been modified considerably. It retained the agency of trade associations, but reduced the national supervisory board to three members and accorded industry greater opportunity for self-regulation. The revised bill did not provide for blanket exemptions from the antitrust laws, but would permit specific exemptions when in the public interest. Control through sanction of trade practices was relied upon in the revised legislation to curb ruthless competition.

Additional evidence of the trend of administration thought toward liberality, flexibility and simplification in its plans for regulation was furnished by the President's talk to the chamber of commerce Thursday night. He made three requests: (1) that employers refrain from further reductions in wages and that wage scales be increased in accordance with rises in commodity prices; (2) that industrial establishments co-operate with each other and with the government; and (3) that individuals and corporations "transfer" their individual welfare into the "welfare of the whole."

Still later, on Friday, Secretary of Commerce Roper, while speaking before the United States chamber of commerce, suggested the organization of a new general co-ordinating committee to be known as the "President's council on business." It would consist of 21 representatives of commerce and industry to advise with the department of commerce. "Such a body," he said, "would be a channel through which the business community could express itself to the government."

Bark Is Worse Than Bite

The great change in a fortnight in the outward expressions of the government's attitude toward business is evident from the foregoing. Then threats of restrictions were emphasized; today the olive branch of assistance is being extended.

But this change is not as real as it seems. To understand the evolution of the plans for industrial regulation one must consider the strategy of President Roosevelt. He is under terrific pressure from all sides. Congress is impatient and hard to control. Some of its members are straining at the leash to enact radical bills. The President also faces the critical scrutiny of public opinion, which to date has been unbelievably favorable.

To cope with these forces the President has the advantage of his political position and the assistance of his advisers—his cabinet and the "collegiate brain trust."

This trust, with Moley, Tugwell, Berle and Ezekial in the front rank, is prolific with ideas. These advisers find it hard to conceal their uncomplimentary opinion of the ability of business men generally. They have unbounded faith in their own theories. Up to now they have had every opportunity to display these the-

Farrell Sees "New Deal" in Foreign Trade Relations

"We are at a point in the world economic affairs," said James A. Farrell, chairman, National Foreign Trade council, at the annual meeting of the United States chamber of commerce, "where all of our existing machinery of international commercial relationships is being overhauled. On the matter of tariffs, we see ahead of us a close scrutiny of basic policies with a view to arriving at new fundamental principles that will work to eliminate discriminations, excessive protection, quotas and the many devices which have grown up or reappeared in recent years. Be it said to the credit of our own country that we have not resorted to quotas; we have not discriminated against other countries. We have endeavored through our flexible tariff to bring our rates of duty down to a formula of production cost equalization that will permit a generous measure of competition in our market to the foreign producers."

ories. Traces of them bob up in the original draft of every new piece of legislation.

But (and here is where the Roosevelt strategy appears) much that is reckless and untried in these ideas dissolves in the modifications of the bills as they progress toward finished form. The rough draft always is more alarming than the final result.

Another feature of this technic is that the inclusion of surprising measures in administration-fostered bills steals the thunder of congress. It appeases the Capitol-hill appetite for radical experiment.

The Rooseveltian tactics in asking for unusual executive powers are equally astute. The President is convinced that the only way he can be prepared to meet any emergency that may arise is to have on hand the necessary weapons and adequate authority to use them. He may never have occasion to employ them, but he wants to be ready for anything.

Express alarm over the President's assumption of unlimited powers to any well-informed Washingtonian and probably he will ask you this question: "Considering the present state of affairs, which would you rather have: (a) action by the President who is responsible to all of the people or (b) attempted action by congress whose members are responsible only to small geographical groups of individuals, and who by the conflicting nature of their interests do not easily agree on national policies?"

Lamont Testifies 30-Hour Bill Would Not Help Employment or Buying

APPEARING before the house committee on labor in connection with the 30-hour week bill, Robert P. Lamont, president of the American Iron and Steel institute said that the iron and steel industry is anxious to co-operate with the government in any sound plan to increase employment and purchasing power.

"And I believe in this emergency," said Mr. Lamont, "It can be done effectively under existing law by a government board or council appointed by the President, supported by a small group of industrial leaders, also appointed by the President, and working through industry as now organized."

Mr. Lamont testified that in his opinion in the steel industry the effect of the passage of the bills under discussion would not noticeably increase either employment or buying power, but in many cases would lead to the closing of plants and consequent unemployment. Costs would be incerased, "and necessariiy selling prices to an extent that would dry up markets, encourage imports of iron and steel and the use of substitute materials."

The witness showed the committee that the steel industry has spread work voluntarily so that under present conditions employes work less, as a rule, than 30 hours a week. Also that industry generally has over the years reduced working hours and days more than 40 per cent without force of law.

"In my opinion," said Mr. Lamont, "the effect of any arbitrary limitations of hours suddenly applied to all industry, would bring one of two disastrous results; first, the actual reduction of employes' income and a lowering of the living standard, or second, an increase in costs which in the end would reduce the markets for products or bring in a flood of foreign goods, both of which would result in shutdowns of factories and bring further unemployment."

Taking the iron and steel industry as a whole, Mr. Lamont testified, it is estimated that it has employed during this depression approximately two and a half times as many men as would have been needed if the policy of spreading the work had not been adopted and almost universally carried out. "In other words," he said, "200,000 extra men have been kept at work."

Both Senator Robinson, majority leader of the senate and Speaker Rainey of the house have stated that the 30-hour week bill is not a part of the administration program. Hearings on the bill closed Friday and it probably will be reported this week.

* * *

Public Works Bill Up Next

President Roosevelt expects to send a public works bill to congress this week, although what the appropriations asked for will be has not been learned.

The bill will call only for appropriations for which the projects can begin at once and no provision will be made for "frills," he has stated to callers.

* * *

The federal trade commission has entered into stipulation agreements with four machinery companies in which the latter agree to discontinue resale price maintenance methods. The companies are Sullivan Machinery Co., Chicago; Chicago Pneumatic Tool Co., New York; Cleveland Rock Drill Co., Cleveland; and Independent Pneumatic Tool Co., Chicago.

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MARRIED 50 YEARS: Mr. and Mrs. Charles M. Schwab celebrated their golden wedding anniversary May 1 at their home on Riverside drive, New York, by a simple reception to relatives and intimate friends. They were wed in Braddock, Pa., May 1, 1883

Iron Ore for Centuries in Mesabi Range; Fair Tax Key to Development

THE great quantity and variety of iron and steel products used annually in this country are made in plants costing many millions of dollars. In order to justify these large expenditures each plant must have available sufficient iron ore to last many years, 20 or 30 years not being considered excessive.

When the existing steel companies were originally formed they had sufficient reserve ore to last 20 years or more, but the great demand for iron and steel has caused these reserves to be depleted rapidly, and now some of the companies are definitely interested in increasing their reserves.

Must Know Reserve Status

These companies have organizations that now are actively mining ore in Minnesota, and they naturally would prefer to increase their reserves in this state. They *must* have additional ore, however, and if they cannot find it in Minnesota, they must begin soon to develop new reserves elsewhere. The quantity of iron ore remaining in the state, therefore, is of great importance at present, although the new reserves that these companies may acquire may not be used for many years.

Two years ago funds were provided by the Minnesota legislature for a metallurgical study of the iron deposits in the state. The Mesabi range was selected for the first investigation because it is both the largest deposit and the simplest from a geological point of view.

During the past two years, this iron formation has been studied carefully to determine the extent and nature of the ore that still remains in this district after about 40 years of active mining operations. Many samples were obtained and brought to the Mines Experiment Station laboratory, Minneapolis, where they were analyzed and tested to determine the possibility of commercially utilizing the material represented by the samples.

TWO years' study by the Mines Experiment Station, University of Minnesota, to answer the question: How much iron ore is there in the Mesabi range? is summarized in the accompanying article by E. W. Davis, superintendent of the station. Considering Mr. Davis' experience, and the fact the question was asked by the Minnesota legislature, the article is one of the most significant ever published relating to Lake Superior reserves. The state, standing to reap the greatest benefit, should invest generously to develop various processes of beneficiation—The Editors.

As a result of this investigation information has been revealed that makes possible estimates of the future total ore reserve of the Mesabi range. The accuracy of these figures may be questioned in some details, but the results of the investigation form a definite basis for judging the future history of the Mesabi range. This is of great interest to the state of Minnesota, since a large proportion of its revenue in the past has come from the iron mining industry.

In the recently published book entitled "Taxation in Minnesota" by Prof. R. G. Blakey, is a chapter on "Mining Taxes" in which the author presents many important facts and several interesting recommendations and conclusions. The final recommendations as to the proper future tax policies of the state are based on the assumption that great quantities of low-grade ore exist in Minnesota from which the steel companies may secure their additional ore reserves if proper taxation methods are established.

Study Low-Grade Ores

The assumption that the quantity of low-grade ore in Minnesota is very large is in accord with prevailing opinions, but the question is of sufficient importance to justify a more definite study of the actual quantity and nature of this low-grade material.

As a result of the investigation carried on by the Mines Experiment Station, more concise evidence as to the extent and nature of the iron ore reserves of the Mesabi range can now be presented. It is hoped that at some later date similar information can be presented regarding the Cuyuna and Vermilion ranges.

The iron formation of the Mesabi

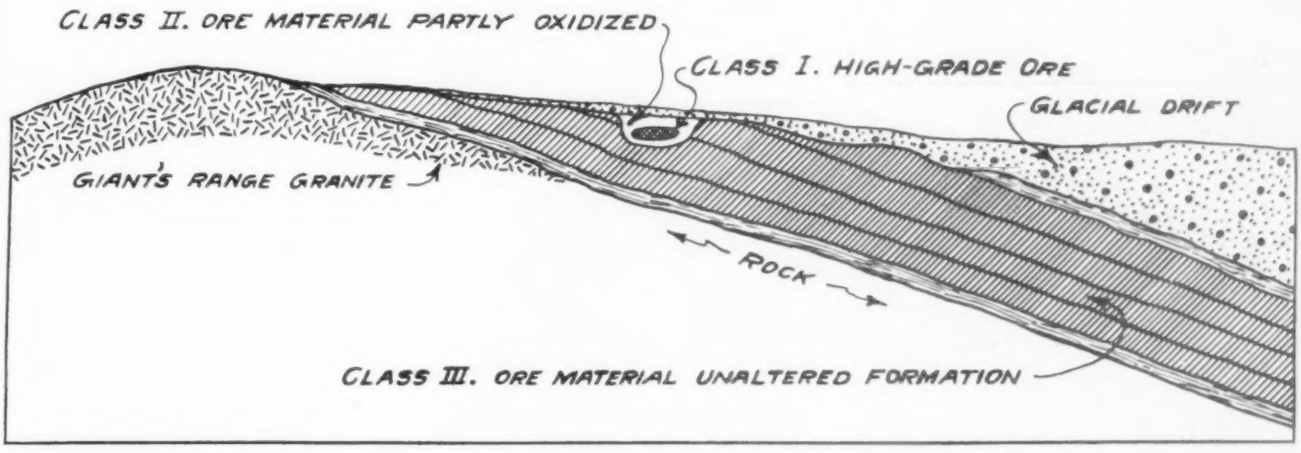


FIG. 1—Idealized cross section of the iron formation of the Mesabi range. This shows the high-grade ore deposit, 50 to 60 per cent iron, of which approximately one-half has been mined; surrounded by the second-class ore, 40 to 50 per cent iron, of which comparatively little has been mined; these surrounded by the enormous deposit of third-class material, 20 to 40 per cent iron. On the following page is depicted the relative size and importance of these deposits, with the second and third-class materials converted to high-grade shipping ore

range, stretching from the Dunka river in the east to the Mississippi river in the west, is about 106 miles long. The range proper consists of low hills of granite, called the Giant range, higher and more pronounced in the east, and less pronounced in the west.

On the south slope of these granite hills, the ore formation lies in parallel beds, totaling about 500 feet in thickness. Glacial drift of sand and gravel cover the formation, thinly near the granite hills, but more and more thickly toward the south. The iron formation is remarkably continuous throughout its total length, and drill holes or test pits put down practically any place in the district will strike the formation.

The iron formation, as originally deposited, contained between 20 and 40 per cent iron, but the forces of nature have altered the formation materially. The chief alteration has been caused by the action of water, and in locations where water had easy access to the formation great changes have occurred. As would be expected, these changes have occurred mainly along the northern border of the deposit, and not toward the south where the formation lies under many hundreds of feet of glacial drift.

The water had both an oxidizing and a leaching effect, and while the original formation consisted largely of silica and iron oxide, in locations where the effect of the water was most pronounced, great bodies of ore are found containing very little silica but composed chiefly of more or less hydrated iron oxide. These are the valuable ore bodies from which the high-grade ore is being mined at the present time. These deposits are usually in the form of shallow, irregular troughs or basins, toward the edges and bottom of which the action of the water becomes less pronounced.

There are, then, three distinct types of material on the Mesabi range which may be classified as:

Class 1, the high-grade direct shipping ore lying toward the center of the troughs and basins, and containing 50 to 60 per cent iron.

Class 2, the partially oxidized and leached material usually associated with the high-grade ore, and containing between 40 and 50 per cent iron.

Class 3, the unaltered formation surrounding these oxidized ores, and containing between 20 and 40 per cent iron.

While all three of these classes have been utilized, only Class 1 has been mined extensively.

Fig. 1 shows an idealized cross section of the Mesabi, showing the Giant range, with the iron formation lying on the southern slope. Overlying this, more thickly toward the south, is the glacial drift of sand and gravel. Near the granite is shown a basin in which water has altered the original formation.

In the center of this basin is the highly leached and oxidized high-grade ore, and surrounding this the partially leached and oxidized ore material. Surrounding the entire basin is the unaltered formation.

On account of the geological nature of the Mesabi deposit, it has been a rather simple matter to locate the troughs and basins containing the high-grade ore. By drilling and test pitting, the quantity and nature of this ore has been accurately estimated.

The exploration for high-grade ore started with the discovery of the Mesabi range in 1870, and has continued until at the present time the actual tonnage and iron content of the high-grade ore remaining in the ground is very accurately known.

There is little likelihood that the estimated tonnage of high-grade ore will be increased or decreased materially either by future exploration or by actual mining operations. This is a very important statement, and the foregoing explanation has been given to show the conditions peculiar to the Mesabi range that made possible such accurate estimates.

Fewer Data on Lower Grades

The same degree of accuracy in computing the tonnages of Class 2 or Class 3 ore materials cannot be claimed, largely because early explorers were chiefly interested in the high-grade ore and preserved little information as to the occurrence and nature of the low-grade materials. However, on account of the simple and uniform nature of the geological formations, estimates can be prepared which show roughly the importance of the Class 2 and Class 3 ore materials.

These materials are, of course, too low in grade to be shipped to the steel plants as mined. High-grade ores may be manufactured from them, however, and in the following estimates, the quantities of high-grade ore that may be manufactured from Class 2 and Class 3 ore materials are reported rather than the actual tonnages of low-grade ore.

It should be understood that these estimates do not take into account any of the economic factors, such as mining costs, taxes, concentration expense, etc., that actually determine whether or not the ore is of value. The estimates simply indicate the amount of each of the three classes of ore that exist on the Mesabi range.

Fig. 2 shows diagrammatically

(Please turn to Page 59)

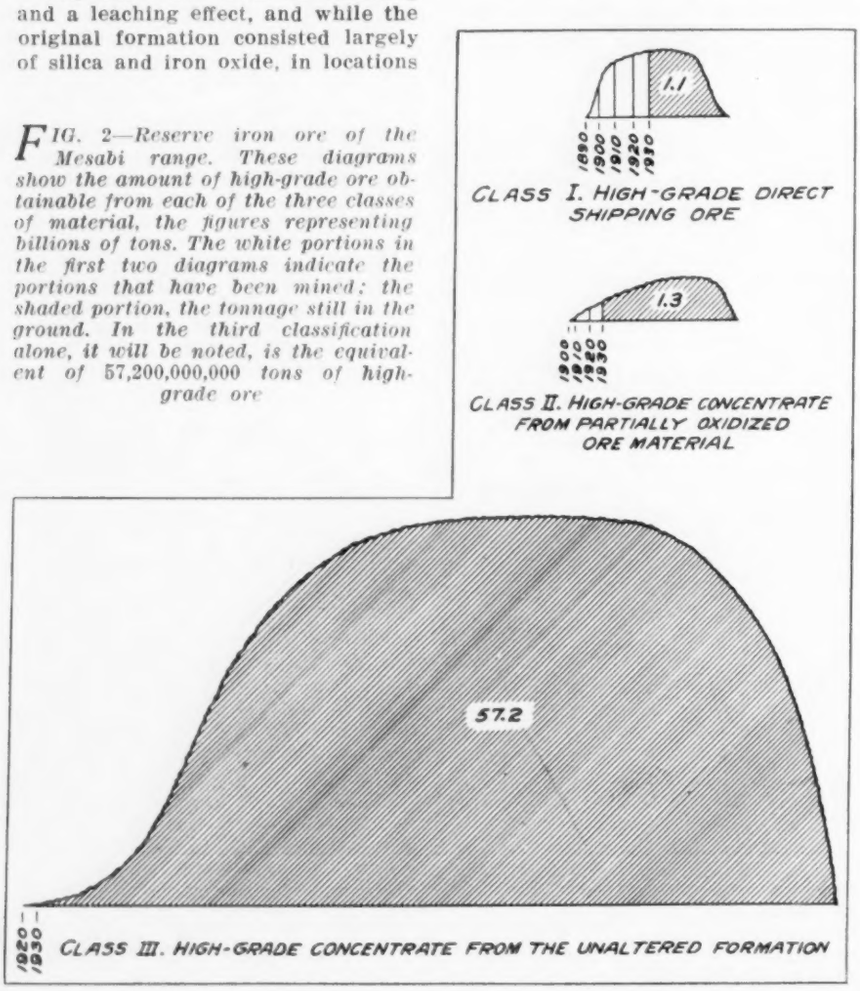
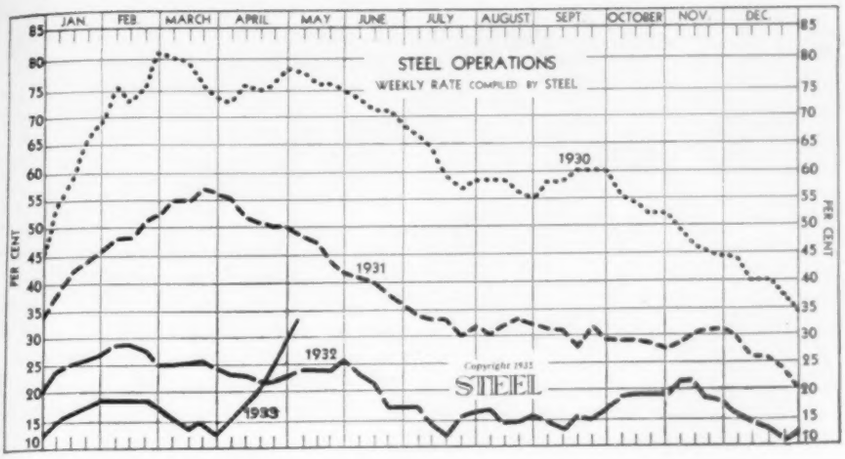


FIG. 2—Reserve iron ore of the Mesabi range. These diagrams show the amount of high-grade ore obtainable from each of the three classes of material, the figures representing billions of tons. The white portions in the first two diagrams indicate the portions that have been mined; the shaded portion, the tonnage still in the ground. In the third classification alone, it will be noted, is the equivalent of 57,200,000,000 tons of high-grade ore



Steelworks at 33%, High for 21 Months, and Still Rising

ADVANCES of ½ to 11 points in all districts save Birmingham, Ala., where a slight contraction has occurred, put the steelworks operating rate up to 33 per cent in the week ended May 6, highest since Aug. 18, 1931.

When the steel rate attained 29 per cent in the week ended April 29 it appeared that much of the momentum of the upswing had been lost, yet last week developed a further rise of 4 points. Indications are that the scheduled improvement in the Youngstown district alone will lift the rate this week at least to 35 per cent.

Pittsburgh

Steel ingot operations advanced one point last week to 22 per cent. This represents the average of operations in open-hearth divisions of five leading producers. Nine steelworks blast furnaces out of a possible 53 will be in blast this week, an addition of one when another Aliquippa, Pa., stack is blown in. In finishing departments, tin plate leads at 55 to 60 per cent, with bar mill and sheet schedules 25 to 30. Strip steel also is strong at 25. Operations in plates, shapes, tubular goods and other heavy hot-rolled products lag.

Cleveland

Steel ingot production for the week ended May 6 averaged 48 per cent, compared with 41 per cent for the preceding week. The Corrigan, McKinney Steel Co. continued with eight open hearths active, and Otis Steel Co. with five. American Steel & Wire Co. has discontinued operation of its open hearths here, as noted May 1, and the increase in the general rate is due largely to adjustments to include operations in the Greater Cleveland district, taking in Lorain, O.

Chicago

Steelmaking operations last week continued to rise, with more than a 3-point gain, to 29-30 per cent. Several more open-hearth furnaces were added; blast furnaces operations were unchanged. Six of the districts 36 steelworks blast furnaces are active, bringing operations back to the highest rate this year. Indications point to a maintenance of recent gains in operations this week. Illinois Steel Co. was to blow in a blast furnace at South Chicago, making three active there, and probably another at Gary shortly, also making three on there.American Sheet & Tin Plate Co. is operating at 75 per cent, with a backlog for 60 days at this rate.

Philadelphia

Eastern steelmaking operations increased less than 1 point, holding at 15 to 16 per cent. Leading producers reported no change in their operations. However, actual requirements the past week have been heavier than indicated, with some producers drawing on stocks for billets.

Buffalo

Steelworks operations reached a high point for two years when they averaged 38 per cent last week, and will probably continue for at least ten days at this rate. Fourteen open hearths are active here.

Birmingham

With the Ensley rail mill off and the general run of business no higher, steelmaking is estimated at 12½ to 15 per cent, compared with 17 the week previous.

Wheeling

Steel ingot operations in the Wheeling district were at 61 per cent last week, an advance of approximately 11 points. As of May 5, 20 out of 33 open hearths were on.

Youngstown

District steel output last week expanded to 33 per cent, up three points, and was expected to advance to about 41 per cent this week. Thirty-four of 83 open-hearth furnaces are melting, against 23 a year ago. Carnegie Steel Co. valley plants closed last week at 45 per cent, up 14 points. Two district blast furnaces are being prepared for relighting. Six are melting in this district.

Operating Rate of the Steel Industry, by Weeks

All figures except the monthly open-hearth and bessemer ingot totals of American Iron and Steel institute are percentages. Estimates are based upon weekly reports from the Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Ala., and Buffalo districts, which are weighted. Weeks end Saturday.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	Steel's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.	22	25	26	27	28.5	25.7	1,454,309	25.86
Feb.	28.5	27	25	25	....	26.4	1,450,648	26.83
March	25	25.5	24.5	23	....	24.5	1,403,723	24.04
April	23	22	22	23	24	22.8	1,233,603	21.94
May	24	24	25.5	23	....	24.1	1,101,994	19.60
June	21	17	17	17	....	18.0	893,899	15.90
July	14.5	12	15.5	16.5	16.5	15.0	790,055	14.61
Aug.	14.5	14.5	15.5	14.5	....	14.7	829,236	14.20
Sept.	13.5	15.5	15	17	....	15.3	971,365	17.28
Oct.	18	19	19.5	19.5	19.5	19.1	1,064,598	18.93
Nov.	21	21	19	17.5	....	19.6	1,010,894	17.98
Dec.	16	15	14	12	13	14.0	843,244	15.00
1933								
Jan.	15.5	17	18	19	....	17.4	1,009,483	17.84
Feb.	19	19	19	17	....	18.5	1,066,339	20.41
March	15	13.5	15	14	15.5	14.6	885,913	15.08
April	17.5	20.5	25	29	....	23.0	.....	.....
May	33	....	..	..	....	....	.....	....

April Iron Gains 18 Per Cent; 10 Blast Furnaces Resume

AN UPSWING in blast furnace activity in April, which netted an increase of ten stacks and raised the operating total from 38 on the last day of March to 48 on the last day of April, lifted average daily production of coke pig iron in the United States to 20,770 gross tons. This was the highest daily rate since last November, with 20,858 tons.

Compared with the March rate of 17,484 tons per day, the April figure was an increase of 3286 tons, or 18.8 per cent. Production in April, one year ago, was 28,254 tons, while two years ago it was 66,986 tons.

Total production of iron in April was 623,097 gross tons, and a gain of 81,084 tons, or 14.9 per cent, over the 542,013 tons of the preceding month. This was in spite of the fact that April was a one-day shorter month than March. The April total was the largest since the 625,753 tons of last November.

For the four months ended April, production amounted to 2,286,962 tons, a loss of 1,467,774 tons from the 3,754,736 tons made in the corresponding period of 1932.

Relating production to capacity, operations in April were 15.1 per cent, against 12.7 per cent in March and 14.3 per cent in February. Operating rates for the current year have been revised slightly upward on the basis of the new capacity figure of 50,313,975 gross tons of coke pig iron and ferroalloys as of Dec. 31, 1932, as announced by the American Iron and Steel institute (STEEL, April 24, page 16).

The total of 48 active blast furnaces on April 30 was the highest since last November, with 51. During April, ten nonmerchant stacks were blown in and only one was blown out, making a net gain of nine for this class. Of the merchant class, one resumed operations and none was blown out or banked.

Furnaces resuming in April were: In Ohio: One Youngstown and Warren, Republic Steel Corp.; Ohio No. 2 and Mingo No. 4, Carnegie Steel Co.; River No. 4, Corrigan, McKinney Steel Co. In Pennsylvania: Neville Island, Davison Coke & Iron Co.; one Carrie, Carnegie Steel Co. In New York: One Buffalo, Republic Steel Corp. In Tennessee, Rockdale, Tennessee Products Corp. In Illinois: South Works New No. 6, Illinois Steel Co. In Indiana: Gary No. 11, Illinois Steel Co.

The only furnace blowing out was Central B, American Steel & Wire Co., in Ohio.

AVERAGE DAILY PRODUCTION

	1933	1932	1931	1930
Jan.	18,348	31,336	55,337	91,573
Feb.	19,752	33,122	61,114	101,640
Mar.	17,484	31,194	65,448	104,930
Apr.	20,770	28,524	66,986	106,371
May	.....	25,282	64,355	104,564
June	.....	20,867	54,599	97,817
July	.....	18,394	47,170	85,110
Aug.	.....	17,035	41,264	81,455
Sept.	.....	19,788	38,947	75,893
Oct.	.....	20,795	37,831	69,851
Nov.	.....	20,858	36,727	62,182
Dec.	.....	17,650	31,625	53,732
Av.	19,051	23,699	50,035	86,141

APRIL IRON PRODUCTION

	No. in blast last day of month Apr.	Mar.	Total tonnage Merchant	Nonmerchant
Ohio	15	11	9,147	217,655
Penna.	15	13	16,721*	144,038*
Alabama	2	2	10,900	20,076
Illinois	4	3	20,190	34,151
New York	2	1	.....	15,553
Colorado	1	1		
Indiana	3	2	.....	94,660
Maryland	2	2		
Virginia	0	0		
Kentucky	0	0		
Mass.	0	0		
Tennessee	0	0	4,268*	35,738
Utah	1	1		
West Va.	1	1		
Michigan	1	1		
Minnesota	0	0		
Missouri	0	0		
Total	48	38	61,225*	561,871*

*Includes ferro and spiegeleisen.

MONTHLY PIG IRON PRODUCTION

	1933	1932	1931
Jan.	568,785	971,437	1,715,443
Feb.	553,067	960,550	1,711,192
March	542,013	967,015	2,028,906
April	623,097	855,734	2,009,582
T'l 4 mo.	2,286,962	3,754,736	7,465,123
May	.....	783,769	1,995,001
June	.....	626,015	1,637,998
July	.....	570,222	1,462,270
Aug.	.....	528,105	1,279,205
Sept.	.....	593,640	1,168,436
Oct.	.....	644,648	1,172,781
Nov.	.....	625,753	1,101,820
Dec.	.....	547,179	980,377
Total	1,663,865	8,674,067	18,263,011

RATE OF OPERATION

(Relation of Production to Capacity)

	1933[1]	1932[2]	1931[3]	1930[4]
Jan.	13.3	22.1	38.4	65.0
Feb.	14.3	23.4	42.5	72.1
March	12.7	22.0	45.4	74.5
April	15.1	20.2	46.5	75.4
May	.....	17.9	44.7	74.2
June	.....	14.7	37.9	69.3
July	.....	13.0	32.7	60.3
Aug.	.....	12.0	28.7	57.8
Sept.	.....	14.0	27.0	53.8
Oct.	.....	14.7	26.3	49.6
Nov	.....	14.7	25.5	44.1
Dec.	.....	12.5	22.0	38.1

[1]Based on capacity of 50,313,975 gross tons, Dec. 31, 1932; [2]on capacity of 51,598,175 tons; [3]on capacity of 52,515,875 tons; [4]on capacity of 51,490,680 tons. Capacities by American Iron and Steel institute.

Miller Still Head Of Gear Makers

E. W. MILLER, Fellows Gear Shaper Co., Springfield, Vt., was elected to succeed himself as president of the American Gear Manufacturers association at the seventeenth annual meeting of the organization in Wilkinsburg, Pa., May 4-6.

All other officers likewise were reelected as follows: First vice president, John Christensen, Cincinnati Gear Co., Cincinnati; second vice president, A. A. Ross, General Electric Co., West Lynn, Mass.; and treasurer, J. H. Jackson, Pittsburgh Gear & Machine Co., Pittsburgh.

Frank W. England, Illinois Tool Works, Chicago; A. C. Gleason, Gleason Works, Rochester, N. Y.; and W. A. Jones, W. A. Jones Foundry & Machine Co., Chicago, were reelected directors.

Five New Members

Five new member companies were received in the association: Ingersoll Milling Machine Co., Rockford, Ill.; National Tool Co., Cleveland; National Broach & Machine Co., Detroit; Union Twist Drill Co., Athol, Mass.; and Watson-Flagg Machine Co., Patterson, N. J.

Sentiment expressed at the meeting indicated improved business conditions and a more encouraging volume of orders. President Miller pointed to the possibilities which lie in the days ahead. Alertness and courage will decide the winners in the ascent to better times, he declared. The future must not be built on the ashes of business destroyed by lack of intelligent direction, diligence and initiative.

President Miller lauded J. C. McQuiston new secretary-treasurer of the association, for his vigor and enthusiasm. Through his thorough study of the organization, he has worked out an economy plan which has strengthened the financial standing of the association appreciably.

DETROIT

IF WHAT Detroit and the automobile industry are now experiencing is not the first leg on recovery, it is a most encouraging imitation.

Dealer requisitions for cars and manufacturers' releases for material assure a May production larger than April, or about 200,000 units. On the basis of an indicator which STEEL will use hereafter, this is 60 per cent of normal.

Some executives now can see into June, and they are unanimous in forecasting an output equal to May. July and August are too distant to read; a sharp decline would not be unseasonal, but any one of a dozen contingencies, including inflation, might cause an upset.

The Detroit of today is almost the Detroit of 1929. Purchasing agents once more are smiling and glad to see salesmen. Rush orders, with costly, insistent telephone followups, are common again. One purchasing agent, foreseeing a possible shortage, recently urged an iron and steel warehouse to maintain a complete stock.

Less Relief Is Needed

Employment in Detroit, now the highest since 1931, has expanded to the point where a number of church and charitably-inclined organizations have discontinued free meals and other relief. Bus lines dropped because of a lack of industrial patronage have been restored. Many small sidewalk stores vending candy, tobacco, gloves and soft drinks near automobile plants have been reopened.

With their recent 30 per cent dividend on "frozen" bank deposits, making a total of 40 per cent salvaged, Detroiters are not only paying some of their past-due accounts but also indulging in luxury buying and cleaning the used-car lots of their better offerings.

The only black spot is the necessity for the city to pay its employes in scrip, inspiring a steel man to suggest that if it is appropriate and not sacrilegious to stamp "In God we trust" on coins, the phrase "I know that my redeemer liveth" should be imprinted on scrip.

This activity is not confined to automobiles. One large manufacturer of electric refrigerators last week closed for a day—not from a lack of orders but to give employes a rest and the maintenance staff an opportunity to make adjustments, after a prolonged run on a 24-hour basis. This manufacturer assembled 30,000 units in April and has scheduled 35,000 for May.

A seamless tube mill, of whose business automotive work is a small proportion, is booked practically solid through the rest of the year. Automobile tire, drug and chemical plants are busier. The Great Lakes division of the National Steel Corp. for several weeks has had all six open-hearth steel furnaces on. Some semifinished material has come in from a Cleveland mill. Stove and radiator plants, however, are under a seasonal blight.

This increased activity focuses attention on the price both of raw materials and automobiles. Predicting is a hazard, but a general advance in automobile prices does not seem probable. For one thing, it would require concerted action in the low-price field, which has never been achieved. Greater volume also would lessen the pressure for higher prices.

From the viewpoint of sales, however, the prospect of higher prices is being capitalized. Packard advertising for several weeks has suggested the possibility of a rise. One manufacturer has told dealers that current prices cannot be guaranteed more than 30 days. Salesmen undoubtedly will use the rising tendency of commodity prices as a selling point.

Cover Ahead on Steel

Meanwhile, more than is generally known, automobile manufacturers have covered their future requirements of pig iron, steel and other products. It probably is the case that a large portion of third quarter tonnage has been quietly covered, especially in the flat-rolled steel lines.

An important automobile manufacturer has arranged with a sheet and strip mill to take in during the remainder of the second quarter a large portion of its estimated requirements for the third quarter.

The consideration to the consumer was the benefit of the present price. The advantage to the mill is that it can operate during the remainder of this quarter at a higher and hence more economical rate than otherwise, and can profit more by this concentration of orders than by spreading them through two quarters. This suggests the possibility that steel production may outrun automobile assemblies this quarter and lag behind during the third quarter.

On lumber for composite bodies

(Please turn to Page 55)

An Index to Auto Activity

DESIRABILITY of some gage of activity of the automobile industry, especially at this time, is apparent. Capacity of the industry is too elastic to supply a safe base; production over a period of years, including all kinds of experience, appears preferable. The three years 1924, 1925, 1926 *saw production in an ascending scale, averaging* 336,000 *units monthly. It is striking that the monthly average for* 1927, 1928, 1929, *also in an ascending scale and including the alltime record of* 1929, *was* 364,000 *units, or practically identical with the previous* 3*-year period. For a broad interpretation of automobile activity* STEEL *therefore regards a monthly average of* 350,000 *motor vehicles in the United States as "normal" production. On this basis, April with an estimated output of* 137,000 *units by the national automobile chamber of commerce, plus some* 40,000 *for Ford, rated* 50 *per cent. May probably will be* 60.

Industrial Men in the Day's News

Howard B. Maguire, Manager of Detroit Office, American Steel & Wire Co.

IN Detroit he directs an office over which he was assistant manager a few years ago.

A NATIVE of Chicago, he is a graduate of the Armour institute, of that city.

DURING the war he served in both the heavy artillery and a motored squadron.

A MAN closely identified with the development and sale of stainless and heat-resisting alloy steel became manager of sales of the Detroit office of the American Steel & Wire Co., April 1, when Howard B. Maguire assumed that post.

Born in Chicago in 1895, Mr. Maguire was educated in that city, receiving the degree of bachelor of science and engineering from the Armour Institute of Technology. From 1914 to 1919 he was identified with the Commonwealth Edison Co., Chicago, in the latter year joining the sales department of the American company, at Cleveland. Three years later he was transferred to the Detroit office of the company, in 1924 being made assistant manager of sales. In 1928 he was transferred to Chicago, becoming assistant to the vice president and general manager of sales, a post he relinquished April 1 to return to Detroit.

Although a relatively infrequent golfer, he is expert enough to have been the club champion of the Meadowbrook Country club, Detroit, almost continuously during the past ten years. During the war he was commissioned in the heavy artillery division, but later served as an aerial observer of the first Liberty motored squadron in France.

ALDEN C. CUMMINS, assistant general superintendent of the Duquesne steelworks and blast furnaces of the Carnegie Steel Co., Pittsburgh, has been appointed general superintendent of the division. Mr. Cummins has been serving as assistant in charge of that division since the death of A. L. Cromlish in June, 1932, and is now given full charge and responsibility.

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Col. Merrill G. Baker, until recently president of the Union Steel Casting Co., Pittsburgh, has been elected president of the Steel Founders' Society of America, New York. Born in Indiana county, Pennsylvania, March 11, 1880, he was graduated from Dickinson college, Carlisle, Pa., in 1904. From July 1, 1904, to Feb. 28, 1915, he was with the Cambria Steel Co., Johnstown, Pa., resigning as assistant to the general manager of sales. Then he became assistant general manager of sales, American Vanadium Co., leaving June 16, 1917, to enter the ordnance department of the army. Following the war he was successively with the American International Steel Corp., New York; Vanadium Corp. of America, New York; Ford, Bacon & Davis Inc., New York, and did industrial financing. In June, 1932, he became executive assistant to the president, Blaw-Knox Co., Pittsburgh, and on Dec. 1 of that year was elected president of the Union Steel Casting Co.

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Howard E. Jeffries, since August, 1931, treasurer of the Carnegie Steel Co., Pittsburgh, has been elected to the board of directors of the company, filling the vacancy caused by the retirement of O. J. H. Hartsuff, general superintendent of Edgar Thomson works, who retired May 1 after 50 years of service.

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Frank F. Slick, assistant general superintendent of the Edgar Thomson steelworks and blast furnaces, Braddock, Pa., of the Carnegie Steel Co., Pittsburgh, has been appointed acting general superintendent of the works, succeeding O. J. H. Hartsuff, who retired May 1. Mr. Slick has been assistant general superintendent at that division since August, 1925.

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Harry W. Dietert, formerly chief industrial research engineer for the United States Radiator Corp., Detroit, has been appointed chief engineer. He has been instrumental in developing sand control methods for the corporation and is a member of several important committees of the American Foundrymen's association.

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M. Edgar Yeager, 726 Chamber of Commerce building, Boston, has been appointed New England district manager of stoker sales for the Patterson Foundry & Machine Co., East Liverpool, O. Mr. Yeager's experience includes more than 20 years with

the American Engineering Co., Westinghouse Electric & Mfg. Co. and Combustion Engineering Corp. in stoker work.

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H. V. Erben has been appointed manager of the switch gear sales division of the central station department of the General Electric Co.

(*Please Turn to Page* 51)

Jones & Laughlin Pipe in World's "Deepest" Well

Drilling of a 7720-foot well, reputed to be the deepest in the world, has been accomplished with the use of seamless steel casing and drill pipe produced by Jones & Laughlin Steel Corp., Pittsburgh, in a recent operation of the North Kettleman Oil & Gas Co., Los Angeles, in California.

The following Jones & Laughlin seamless pipe was used: A string of 9933 feet of 4½-inch o.d. 19.6-pound special drill pipe; a string of 11¾-inch o.d. 61-pound seamless casing set at 6815 feet; and a string of 7-inch o.d. 30.3-pound and 36-pound grade D seamless casing set at 9642 feet. The upper section of the 7-inch string consisted of 6142 feet of 30.3-pound and the lower section of 3500 feet of 36-pound casing. The entire string of 9642 feet was run in 25 hours.

Died:

JAMES R. LAWTON, 54, manager of roll sales, Ohio Steel Foundry Co., Lima, O., in Cleveland recently. Previously he had been connected with the Mesta Machine Co., Pittsburgh, and Wheeling Mold & Foundry Co., Wheeling, W. Va. During the construction of the Panama canal he was chief inspector on all materials purchased in this country.

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Charles N. Cuthbert, 84, cashier and oldest employe of the Simonds Saw & Steel Co. plant, at Lockport, N. Y.

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Richard S. Rubicam, 51, representative of the Ottumwa Iron Works in the Denver district, at Denver, April 28. During the world war he organized the Herr-Rubicam Co. to sell machinery and railroad supplies. He next was president of the William A. Box Iron Works Co., Denver, and about a year ago joined the Ottumwa company.

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Adelbert R. Clizbe, 77, president, Clizbe Bros. Mfg. Co., Plymouth, Ind., manufacturer of grinding machinery, April 27.

New Waterway Helps Chicago Compete in Southwest Markets

WHEN the Inland Steel Co. recently sent a shipment of 900 tons of steel products by river barge from Chicago to St. Louis and Memphis it heralded a development in transportation facilities that shortly will exert an important influence upon some of the markets served by the Chicago and Pittsburgh steelmaking centers.

This water movement was made possible by the virtual completion of the Illinois waterway, a 60-mile stretch that joins the Chicago sanitary canal, the Chicago river and Lake Michigan at one end and the Illinois and Mississippi rivers and the Gulf of Mexico at the other. Formal opening will take place June 15.

Aside from its importance to the steel industry, the building of the Illinois waterway is of considerable moment to other industries in supplying the necessary link for a lakes-to-gulf inland water route. The Great Lakes now are connected through the Chicago gateway with a water transportation system that stretches to New Orleans, Corpus Christi, Tex., Pittsburgh, Kansas City, Minneapolis, St. Louis, Memphis and other cities along the Mississippi.

While the Illinois waterway is completed in its essential details, facilities are not yet available for the regular service to southern points that Chicago steel producers plan.

Limited Movement This Year

Movable bridges over the sanitary canal still must be equipped with machinery to provide more than the present clearance of 16 feet. This means that at the moment only certain types of equipment can navigate the entire route.

Barge rates have yet to be fixed. The federal barge line does not plan to extend its service as far north as Chicago until July 1, when towboats designed to provide necessary bridge clearance in the sanitary district canal are expected to be ready.

Only a limited movement of steel products from Chicago consequently is anticipated this season, but with the providing of additional facilities and expanding industrial activity a heavy steel traffic is looked for. Estimates on all types of commodities point to the potential transportation of 5,000,000 to 10,000,000 tons of freight annually.

So far as Chicago steel producers are concerned, the new waterway in effect will help them to regain markets in the South and Southwest that have been lost to other districts, particularly Pittsburgh. Chicago lost Pacific coast business to eastern mills when the Panama canal was opened and permitted the latter to ship by rail to the eastern seaboard and by boat westward cheaper than steel could be moved by rail from Chicago to the west. Canalization of the Ohio river gave the Pittsburgh and Wheeling producers a low-cost route to Memphis, New Orleans and the South.

Chicago Mills Regain Position

The all-rail rate on steel products from Chicago to Memphis is 40 cents, including surcharge, and 33½ cents for a combination rail and river route, while the barge rate from Pittsburgh to Memphis is only 20 cents. To New Orleans the all-rail rate from Chicago is 57 cents, or 47½ cents for rail and river, against 25 cents on 500 ton lots by river from Pittsburgh.

This freight rate disadvantage of Chicago, despite the fact that it is 300 miles closer than Pittsburgh to these distributing points, will be offset by the transportation facilities the Illinois waterway provides.

This new artery cost $102,500,000, only a small portion of which sum was furnished by the federal government. The Chicago sanitary district spent $75,000,000 on the 30-mile canal built from Chicago to Lockport, Ill., for sewage disposal purposes, while Illinois expended $20,000,000 on the 60-mile section from Lockport to Utica, Ill.

Work on the latter started in 1921 and in 1931 state funds became exhausted due to additional expense in building of bridges. The government then completed the construction at a cost of $7,500,000.

Five locks and dams were required in the building of the state waterway, all of which are 110 feet wide and 600 feet long. About 10,000 tons of steel was involved in this work.

V. G. Iden Also With Iron And Steel Institute

The American Iron and Steel institute, New York, has arranged with the American Institute of Steel Construction to share the services of V. G. Iden, director of public relations of the latter organization. This will enable the American Iron and Steel institute to be better prepared to answer the numerous inquiries which are being constantly received from editors and publishers regarding steel and its manufacture.

EDITORIAL

Industry Needs Pulmotor, Not a Strait Jacket

THE Roosevelt administration's ideas in regard to the supervision and regulation of industry have changed considerably in the last month. Judging from recent events, the President and his advisers are maintaining open minds as to methods and are striving conscientiously to discover a workable plan of control.

In mid-April, the administration looked with favor upon certain features of the Black bill. This legislation met the President's desire for a legalized spread-work plan, but it contained what Speaker Rainey characterized as dynamite in its use of restrictions on interstate commerce as a club to enforce the short-week proposal. Due partly to the protests of industrial establishments and also to its own desire to incorporate the spread-work idea into a plan of broader scope, the administration 10 days ago abandoned its espousal of the Black bill and since that time has been evolving a new program designed to cover all of the phases of government co-operation with industry.

This most recent program is being written into a "national industry recovery act," details of which are presented on page 11 of this issue. It provides for a government board of seven, headed by the secretaries of commerce and labor, and including representatives of finance, industry, agriculture, labor and the public. This board will have powers similar to those vested in the war industries board during the World war.

Recovery Act Provides for Federal Umpires, Regulation, R.F.C. Loans, Labor Policy, Etc.

The national board will work with each industrial group through its trade association. The provisions of antitrust laws will be set aside during the period of the emergency. The board, acting through its organization of associations, will have supervision over production, prices, employment, wages, and possibly some other factors of industrial operation. The board will be empowered to pass upon the applications of industrial companies for loans from the Reconstruction Finance Corp. According to the tentative plan, industrial concerns would be obliged to guarantee employes the right of collective bargaining.

If we interpret President Roosevelt's attitude correctly, he is concerned primarily only with certain objectives, chief of which is such control or regimentation of industry as will enable it to get back upon its feet, give needed employment to as many workers as possible and provide profits instead of losses to stockholders. The President also has intimated that he is seeking a means of preventing "overproduction" and of mitigating the evils of ruthless competition. Apparently he is willing to suspend temporarily the provisions of the antitrust laws in order to facilitate the attainment of these objectives.

Industry Not Averse to Sensible Control as Emergency Measure, But Wants Flexibility

If the foregoing is a reasonably accurate summary of the President's motives in encouraging regulation of industry, then it should be possible for representatives of the government and of industry to unite on a program that will produce the desired results. To be workable, the plan must be modified considerably from its present form. It should provide for self-government by industry under the safeguards of federal supervision and control. It should be as simple and as flexible as possible, and above all it should be free of dynamite such as that which lurks in interference with interstate commerce and in compulsory adoption of the policy of collective bargaining.

Industry should welcome the opportunity to participate in the shaping of the national industry recovery act. Obviously there are many advantages in the functioning of a board similar to the war industries board. The majority of industrial executives will be willing to sacrifice certain rights and privileges temporarily for the benefits to be derived from sanely coordinated activity.

But if these benefits are to be had at too great a cost, or if the emergency is to be used against industry to wrest from it permanently certain fundamental rights it has established through long development, then industry will be better off in the long run if it is left to work out its own salvation without government assistance.

Let's have sensible, temporary control similar to what we had during the war, but let us avoid at all costs a plan that will put industry in a strait jacket.

THE BUSINESS TREND

Cheered by Gains, Business Eyes Washington Warily

MOST of the current reports of business are favorable. Activity in many important industries is expanding, and commodity prices—so important in the process of recovery—are definitely higher than they were a year ago.

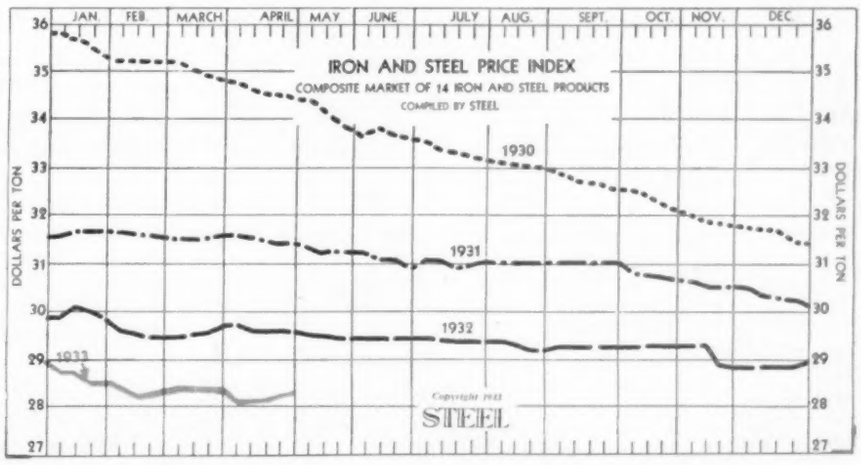
Pig iron output in April was about 15 per cent in excess of that of March. On the basis of weekly estimates, production of steel ingots in the fourth month should show a gain of at least 55 per cent over March. Carloadings of revenue freight also are mounting. The figures for the week ending April 29 will be sharply upward; preliminary reports for important railroads indicate a marked increase in traffic. As stated in detail in "Mirrors of Motordom" elsewhere in the issue, the automobile industry is enjoying a spurt which seems destined to carry throughout May and well into June.

Many of the commodity price barometers stand higher today than they did a year ago. Dun & Bradstreet's wholesale commodity price index on May 1, 1933, was about 1 per cent above the corresponding figure for May 1, 1932. Dun & Bradstreet's daily weighted price index of 30 basic commodities now is running about 12 per cent above the comparable number a year ago. Moody's price level on May 3 was 3 points above the highest peak touched in the entire year of 1932.

Meanwhile business sentiment is in a curious state. Optimism due to the encouraging improvement is tempered by troubled speculation as to the final outcome of the Washington proposals for regulating industry. Opinion in industrial circles extends all the way from unqualified approval of the most radical ideas that have been voiced (even tentatively) to strong condemnation of any plan that will restrict certain rights which are considered basic.

Is Administration Employing Trial Balloons To Test Public Opinion on Policies?

To date the administration has shown unusual skill in dealing with the demands and protests of both business and congress. A few of the Rooseveltian plans which at first shocked industry later were dropped or modified, giving rise to the belief that the administration is proceeding cautiously and will sound out competent opinion quite thoroughly before acting decisively on matters affecting business directly.



1933

April 29....$28.20
April 22.... 28.18
April 15.... 28.14
April 8.... 28.14

1932

April 30....$29.70
April 23.... 29.74
April 16.... 29.74
April 9.... 29.74

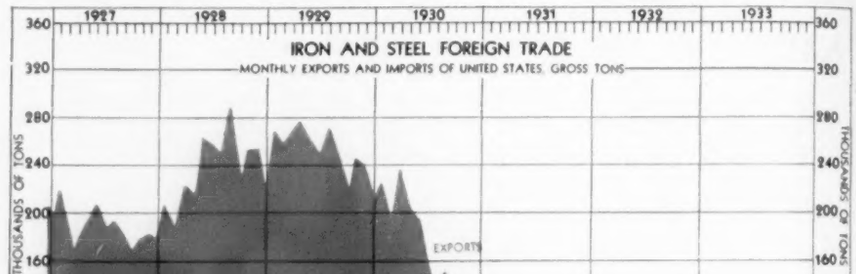
March, 1933	60
February, 1933	64
March, 1932	67

Industrial Production Index Declines Sharply in March

The index of industrial production as reported by the Federal Reserve board declined four points in March. The index figure for the month was 60 which compares with 64 in February and 67 in March, 1932. Unsettled banking conditions in the first half of March somewhat retarded normal seasonal developments in industry and trade, although improvement was noted during the latter part of the month, especially in food products which gained 1 point to 90.

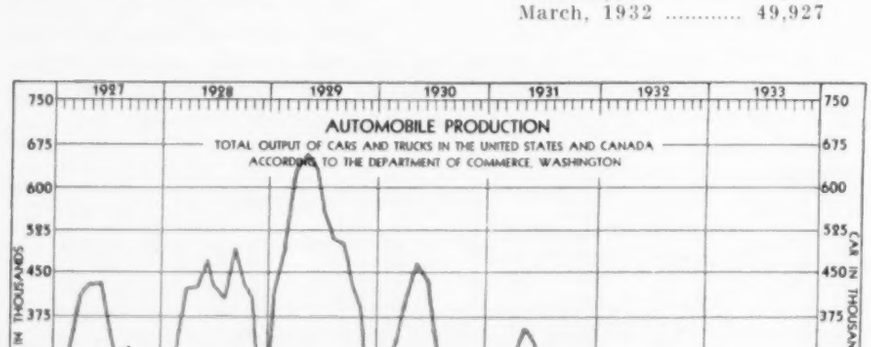
Iron and Steel Exports Gain; Highest in 20 Months

Due to the sharply rising trade in scrap, this country's foreign trade in iron and steel rose sharply in March. According to statistics compiled by the iron and steel division of the department of commerce, exports reached a total of 80,567 gross tons, highest for any month since July, 1931, and exceeding exports of March, 1932, by a margin of 60 per cent. Imports at 22,114 gross tons were the highest since December, 1932, but were only 54 per cent of imports in March, 1932.



Exports	Tons
March, 1933	80,567
February, 1933	63,936
March, 1932	49,927

Imports	Tons
March, 1933	22,114
February, 1933	19,748
March, 1932	41,031



March, 1933	125,224
February, 1933	110,123
March, 1932	127,277

Automobile Production Gains in March

Production of passenger cars and commercial motor vehicles in the United States and Canada in March totaled 125,224 units. This is a gain of 15,099 units over the previous month and compares with the 127,277 units produced in March, 1932. According to the current report from the United States department of commerce, the March output embraced 105,812 passenger cars, 5927 of which were manufactured in Canada. Automobile Chamber of Commerce estimates output for April at 137,000 units.

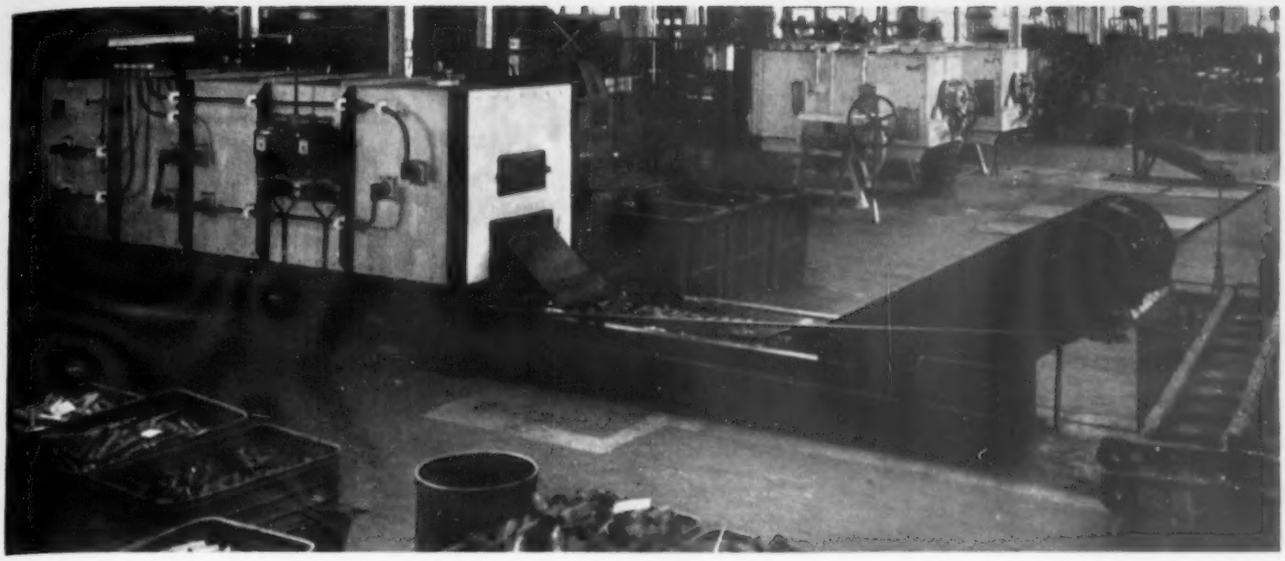


Fig. 4—A continuous pusher-type electric furnace for hardening steel rollers in pans. Its heating rate is 32.7 pounds per square foot per hour. This furnace is No. 10 referred to in Table I

DETERMINING THE TRANSMISSION OF HEAT IN INDUSTRIAL FURNACES

Part II

BY M. H. MAWHINNEY
Fuel Engineer, Electric Furnace Co.,
Salem, O.

WITH increase in furnace temperature, there is a definite increase in the coefficient of heat transfer, nevertheless, no positive relationship is established. Likewise, increase in the ratio of interior refractory area of the furnace to effective heat absorbing area of the stock produces an increase in the coefficient, but here again no definite relation is developed.

At this point, we shall study the relation between mean temperature head and the rate of heating. Points 1 and 2 on the curve of Fig. 2 are for the same furnace operated at different rates, and indicate that the relation between rate of heating and coefficient is about the same for any furnace at different rates as it is for all ordinary commercial furnaces at various rates.

If this statement is correct, then for any furnace of the example it is possible to show the relation between the mean temperature difference, or "head," and the rate of heating, because the hearth area and the effective heat absorbing area remain constant in a given furnace. Therefore, the heat absorption per square foot of stock varies directly with the rate of heating. By dividing the heat absorption of several rates by the values of the coefficient from Fig. 2 for the same rates, the mean temperature head for those rates is determined. Fig. 5 shows this relation worked out for some of the examples of Table I.

This illustration shows the mean temperature head. Its practical application, including the determination of final temperature head, will be discussed later. It will be seen that the magnitude of the temperature head varies for the different types of furnaces, but that the effect of the rate of heating on the head is the same for all types. This is to be expected with all the curves based on the use of the same relation between coefficient and rate, as given in Fig. 2.

Heating of steel which is already partially hot is a requirement of many furnace installations, and is a condition under which it is particularly difficult to predict the temperature head required. Examples of this type of heating are the annealing of forgings before they cool, and the reheating of forgings. Reliable examples necessary for very definite conclusions are not available, but a few with which the writer is familiar are worked out, to give a tentative idea of the effect of preheated stock. The data for these examples are given in Table III. These examples have been plotted in Fig. 6 to show the relation between overall coefficient and rate of heating and the curve of

Table III

Effect of Preheated Stock on Overall Coefficient

No. of Furnace	Fuel Utilized	Purpose of Furnace	Product Heated	Type of Furnace	Temperature, Deg. Fahr. Furnace	Preheat	Rate of Heating, Lbs./Sq. Ft./Hr.	Overall Coefficient, B.t.u./Sq. Ft./Hr./Deg. Fahr
20.....	Electricity	Annealing	Steel disks	Roller	1550	1000	39.2	20.5
21.....	Electricity	Reheating	Forgings	Batch	2450	1750	81.8	42.8
22.....	C.I	Normalizing	Cranks	Pusher	1650	1200	57.0	27.4
23.....	Natural gas	Hardening	Axles	Walking beam	1600	1000	38.2	22.7

Fig. 2 for cold stock has been reproduced to show the comparison.

In the calculation of the overall coefficient the same method was employed as for cold material, except that the heat content of the steel at the entering temperature was deducted from the heat content for the final temperature in calculating the heat absorption per square foot of stock. The mean temperatures of the steel surface were, of course, higher than for cold stock.

Preheating Raises Coefficient

The curves of Fig. 6 show definitely that the preheat of the stock raises the overall coefficient above that for cold stock for the same rate of heating, in pounds per square foot of hearth per hour, in spite of the fact that available data are scarce. In view of the small number of points, the curves have been drawn in dotted lines to show the apparent relations for the different values of preheat. Further data collected will be used to establish these relations more definitely.

Using the relations of Fig. 6, it is again possible to calculate the mean temperature head at different rates of heating for the examples of Table III and the result is given in the two solid lines of Fig. 7 for examples 22 and 23.

The dotted lines of the illustration show the curves for examples 11 and 12 from Fig. 5. The furnaces of examples 12 for cold stock and 23 for 1000 degree preheat were installed in line and were of identical design with the same axles passing through them to be first normalized, then cooled to 1000 degrees between furnaces, and finally heated for hardening. A long thermocouple was run continuously through the two furnaces so that an extremely reliable idea of the effect of preheat is available from a study of these curves which are connected by arrows in the illustration. The furnaces of examples 11 for cold stock and 22 for 1200 degrees preheat were not in the same plant, but were similar furnaces heating a similar product.

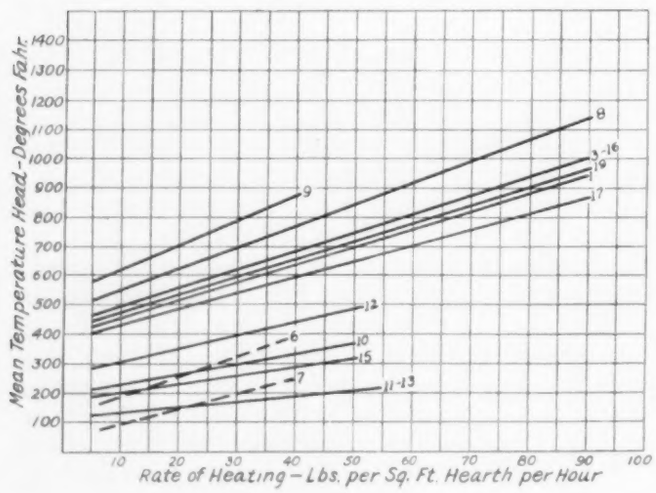
The curves of Fig. 7 indicate that the mean temperature head required to heat stock which has been preheated to 1000 degrees Fahr. varies from 29 per cent of that required for cold stock at a rate of 10 pounds per square foot per hour to 35 per cent at a rate of 60 pounds. Similarly, the mean head for heating stock from 1200 degrees Fahr. initial temperature varies from 28 per cent of that for cold stock to 37 per cent for the same rates. These values indicate a discrepancy in the data since the percentages for 1200 degrees preheat should be somewhat smaller than for 1000 degrees, but the agreement for these two widely separated examples does prove that the relations established are at least approximately correct.

The comparison between 1000 degrees preheat and cold stock is probably more correct than that for 1200 degrees preheat because, as was explained, the conditions of the test in that case were ideal for a comparison. More investigation is needed, however, on the subject of preheated stock.

Knowledge of the value of the final temperature head often is of more practical importance to metallurgists than that of the mean temperature head in a furnace. By final temperature head is meant the difference between the temperature in the furnace at the point where the stock is discharged and the surface temperature of the stock at the time it leaves the furnace.

Temperature Heads Compared

To establish a relation between the final temperature head and the mean head, Table IV was prepared to show the values of the two temperature heads for the majority of the examples of Table I. From the information in this Table, Fig. 8 was prepared to show the graphical relation between the ratios of mean head to final head and the rate of heating in



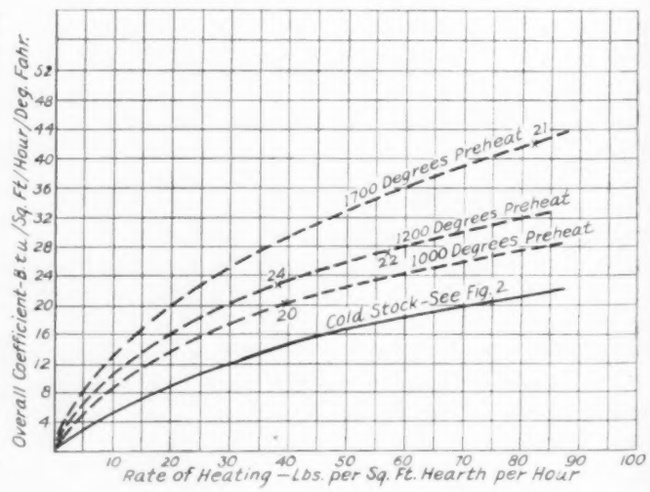


Fig. 5 (Left)—The mean temperature difference between furnace and heated material must be increased to increase the amount of material heated in a furnace. Fig. 6 (Right)—Dotted lines show that the overall coefficient of heat transfer is greater when hot material is charged into a furnace than when the material is heated from cold

the furnace. The points marked by black dots are for cold stock and those indicated by crosses are for the preheated examples of Table III.

It is evident that there are not sufficient points available to establish a definite relation, particularly in the case of preheated stock. However, two tentative curves have been drawn in to represent the apparent relation for cold and preheated stock, based upon the points available.

It will be seen that lower values of the ratio are indicated for both low and high rates of heating than for the more usual rates of furnace operation. This appears to be entirely logical since the fact that the surface of the steel is up to temperature for a long period at low rates of heating causes the mean head to be relatively low, while at high rates the final head is relatively high.

The curves of Fig. 8 will serve to indicate the approximate final head to be expected at any given rate of firing for usual types of furnaces, not including those heated by luminous burners or those in which the pieces to be heated are unusually large with long heating cycles as previously discussed.

Table IV

Relation of Mean Head To Final Head

No. of Furnace	Mean Temperature Head, Deg. Fahr.	Final Temperature Head, Deg. Fahr.	Ratio: Mean Head to Final Head	Rate of Heating, Lbs./Sq. Ft./Hr.
1	650	80	8.2	41.6
3	780	67	10.1	38.0
5	780	70	11.1	33.7
8	900	150	6.0	60.0
9	600	70	8.6	5.8
11	160	17	9.6	24.2
13	144	20	7.2	27.0
14	190	20	9.5	23.5
15	157	25	6.3	5.9
16	680	325	2.1	53.3
17	880	400	2.2	83.3
18	290	50	5.8	15.2
20	150	20	7.5	39.2
21	170	85	2.0	81.8
22	85	30	2.8	57.0
23	130	25	5.2	38.2

Examples of Calculation

As an example of the use of the data in this article to determine temperature heads, suppose that 10,000 pounds of steel pipe are to be heated in a furnace 25 feet wide and 13 feet long to 1700 degrees Fahr. for normalizing. The pipes are ⅞-inch outside diameter and 23 feet long and are carried through the furnace on hot chains. Then, to determine the temperature head:

$$\text{Rate of heating} = \frac{10{,}000 \text{ lbs.}}{25 \text{ ft.} \times 13 \text{ ft.}}$$

$= 30.8$ lbs./sq. ft./hour.

From Fig. 2 the overall coefficient of heat transfer at this rate of heating is 12.1 B.t.u./sq. ft./hour/deg. Fahr.

On 1½-inch centers, 104 pipes will be in the furnace and the surface area of each pipe is 5.28 square feet, so that the total area of receiving surface is $104 \times 5.28 = 550$ square feet.

The heat content per pound of steel at 1700 degrees Fahr. above 60 degrees is 250 B.t.u., so that the total heat absorbed is $10{,}000 \times 250$ equals 2,500,000 B.t.u. per hour. Then, let H = mean temperature head, and

12.1×550 sq. ft. $\times H = 2{,}500{,}000$ B.t.u. per hour and

$H = 375$ degrees Fahr. mean temperature head.

Using the values of Fig. 7, the ratio mean head to final head at a ratio of 30.8 pounds per square foot per hour is 9.4, so that the final head in this case will be

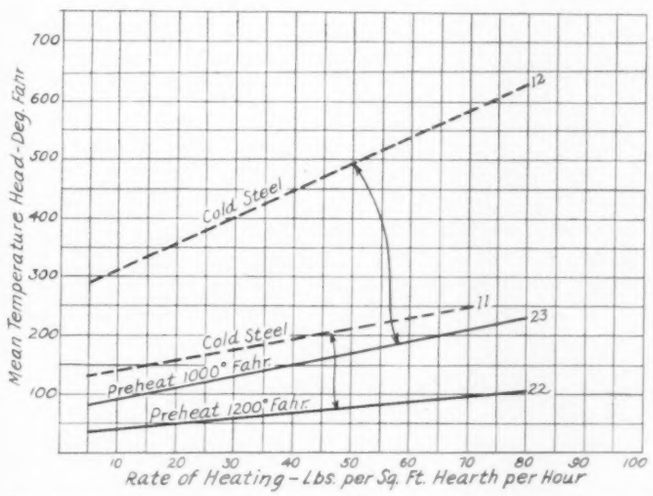
$$\frac{375}{9.4} = 40 \text{ degrees Fahr.}$$

In conclusion, it must be repeated that the data submitted in this article are not in sufficient quantity for the determination of absolutely definite relations. It is the intention to show a method of attack and offer tentative relations established from available data on a subject which has long been a matter of conjecture in the absence of any definite published facts.

Plan Handbooks To Provide Metal Cutting Data

If a super "speed boss," possessing and imparting all existing practical knowledge of cutting metals, might visit all the machine shops of this country and assist the men running them in bringing their metal cutting practice up to what could be achieved by their machinery and high-speed tools, it would be worth millions of dollars to the industry. A research committee of the American Society of Mechanical Engineers is proposing to provide for such a "boss," through the medium of handbooks to be published and sold by the society. These handbooks would make readily available to shop superintendents, foremen, rate-setters, machinists, etc., authoritative data with respect to feeds and speeds at which machines should be operated in cutting each type and grade of metal with each type of commonly used cutting tool.

This project is to be undertaken by a subcommittee of the society's special research committee on cutting of metals.


Mean Temperature Head - Deg. Fahr.
Rate of Heating - Lbs. per Sq. Ft. Hearth per Hour
Cold Steel
Cold Steel
Preheat 1000° Fahr.
Preheat 1200° Fahr.

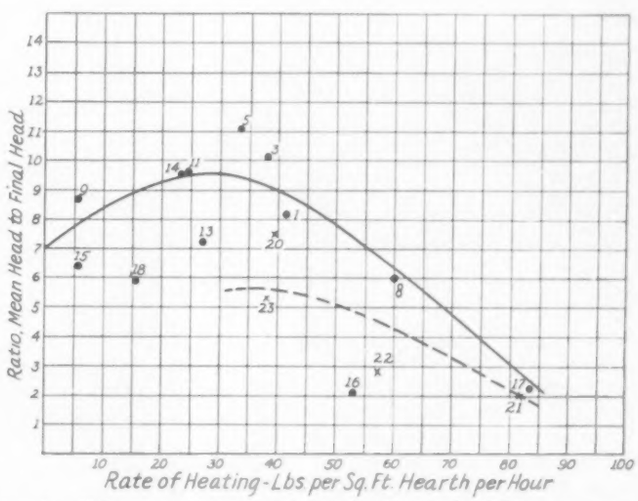


Fig. 7 (Left)—Comparison of dotted lines and solid lines shows the difference in temperature head required between preheated steel and cold steel entering the furnace, other conditions being the same. Fig. 8 (Right)—The final temperature head in a furnace is greatest with respect to the mean temperature head when the production varies either above or below the usual heating rates

Welding Industry Urged To Intensify Selling Efforts

CONCENTRATION on merchandising, broadening and development of markets with the consequent result of linking welding with creative enterprise rather than so close a tie-up with repair construction in the minds of users, was urged by leading speakers at the fourteenth annual meeting of the American Welding society at the Governor Clinton hotel, New York, April 27 and 28.

Departing from the customary highly technical program, the society devoted but a small portion of the two-day schedule to research and technical reports. Broader application of the various methods of welding, with intensive and intelligent campaigning for its acceptance in both consumer and producer industries, was the keynote, sounded notably by Charles F. Abbott, executive director, American Institute of Steel Construction, and Willard T. Chevalier, publishing director of the *Engineering News-Record*. Frank P. McKibben, consulting engineer, Black Gap, Pa., was re-elected president. Other new officers were announced in the May 1 issue of STEEL, p. 18.

Steady progress in the use of fusion welding and gas cutting in machinery and industrial equipment construction was crystallized in the submission of a tentative code applicable to that field. The code was introduced in a committee report, which brought out considerable discussion and much favorable comment. Leading advocates, while urging that a welding code was urgently needed, also stressed importance of indicating clearly that such a code at this time should be tentative only.

Complete Data Lacking

It was brought out that one of the largest users of steel mill equipment had recently convened its plant engineering staff to consider the use of rolled steel and welding in plant construction. One of the drawbacks was the surprising lack of data, indicating the need of a tentative code at least. The tentative specifications, covering, in general, steels containing less than 0.30 per cent carbon, making recommendation for heat treatment, favored the welded structure being heated slowly in a furnace, held for one hour per inch of thickness, at 1000 to 1200 degrees Fahr. and allowed to cool slowly before removal. For steel containing more than 0.30 per cent carbon, a higher temperature range, 1300 to 1400 degrees Fahr., was recommended. The proposed code would not restrict special heat treatments necessary to bring out definite physical properties.

Three classes of weld metal were recommended for straight carbon steel structures, under three classes. Class one provided for an all weld metal tensile specimen with a minimum tensile strength of 65,000 pounds per square inch, to show an elongation of at least 20 per cent in 2 inches. Minimum specific gravity of an all weld metal unpeened specimen, 2 inches long and ⅝-inch in diameter, should be 7.80. For class two, using a reduced section tensile specimen in accordance with the A.S.M.E. code for unfired pressure vessels, minimum tensile strength should be that of the parent metal with a free bend test showing an elongation of at least 20 per cent in 1 inch. Class three, covering use of another reduced section tensile specimen, requires a minimum tensile strength of 42,000 pounds per square inch with a free bend test showing an elongation of at least 10 per cent in 1 inch.

Piping Code Introduced

A tentative code for fusion welding of pressure piping, covering a centrifugal welded joint, was submitted. This code, formulated in cooperation with the American Society of Mechanical Engineers, has not been officially approved by either society, and is subject to revisions. The recommendations are much the same as those made two years ago, there being minor revisions only.

Declaring that many plant executives are production-minded, having received their early training in the plant, Charles F. Abbott stated many leaders were vague as to market research and development. He said some such executives lagged in merchandising the product of their great plants. Approval of large appropriations for plant equipment have been frequently forthcoming, but funds for market promotion were often refused or reduced to an ineffective point. He claimed management in many instances had overdone expenditures for production increases, and said business cannot squeeze profits from bricks and mortar. Direct approach to better prices and insured profits is through increase of consumption that will more nearly approach the ability of these plants to produce.

Mr. Abbott strongly urged intensive and specialized merchandising, development of markets and new applications, protection and expansion of existing markets, education and other activities relating to distribution and costs. He outlined the im-

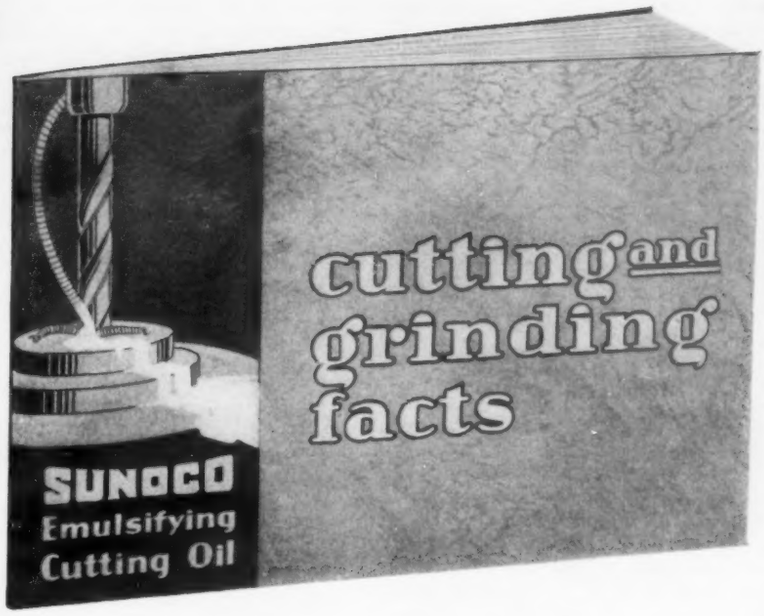
Making Beer Barrels of Carbon Steel

THE A. O. Smith Corp., Milwaukee, is introducing a steel beer barrel and is preparing to produce it on a large scale basis. The company already has received some large orders and now is making 1000 barrels a day.

The Smith container, shown in the accompanying illustration, is made of medium high-carbon steel, is of all-welded construction and in the popular half-barrel size weighs about 60 pounds. It is lined with a coating of a special composition that adheres readily to the steel. Thorough tests are said to show that this coating gives neither taste, odor nor color to the beer.

Collar Assists Handling

The half barrel is 23 inches high and 17½ inches in diameter with a bilge or collar which is fabricated around the center of the circumference, thus facilitating handling. The usual wood bung is employed. Exterior of the barrel is painted and the purchaser may attach any characteristic decorations he chooses. The container will be furnished in quarter, half and full barrel sizes.



To the Metal Cutting Industry—

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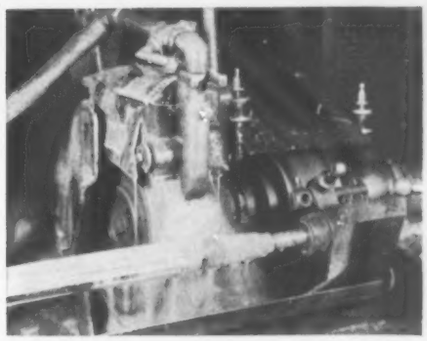

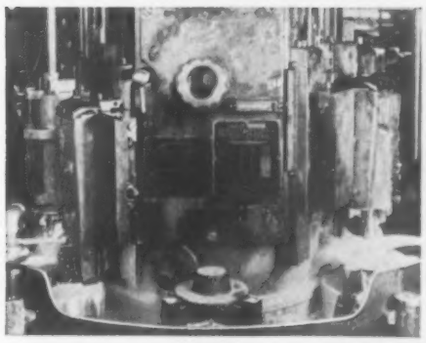

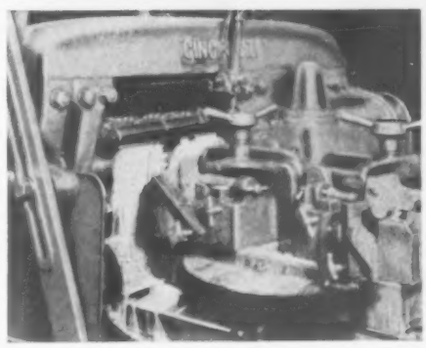

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portance of complete co-operation in every industry and progressive support of trade associations, especially in the period just ahead when watchfulness against possible legislation unfavorable to industry is advisable.

"In the field of welding," he said, "we are experiencing changes and advancements that should call for an organization of interests and a practical co-operative program. The rapid development of welding, and its broad application, presents problems of national importance that must be met if the industry is to maintain its economic position.

"The training of operators, standard tests for inspection, research to expand the safety and practicability of welding are all essential factors that call for co-operative effort on the part of all the interests involved.

"As an indication of the changes that are taking place, reference can be made to an old established manufacturer of rivets who has added welding wire to his present line." (STEEL, Sept. 12, p. 34).

Must Look to Liquidity

Importance of keeping a business unit flexible and liquid during the present period of transition, was stressed by Willard T. Chevalier, who also sounded a warning against too sudden and extensive standardization in any one manufacturing line. Outlining necessary advances to be made for recovery of industry and business, he noted the need of restoration of credit and confidence, revival of capital investment and lowest possible costs, suggesting the part of the welding industry may take in the recovery.

Two broad fields for research and development of welding were suggested by Mr. Chevalier, one covering that for consumer goods and the second for the manufacture of producer goods. Each offers different and separate detailed problems. In the consumer outlet, successful merchandising, he stated, would follow two yard sticks—low price and that which is new.

Especially will consumers show interest in new and novelty types of merchandise, he claimed, saying that while deferred demand for consumer goods was heavy, it did not follow that this demand would be for something along lines purchased three or more years ago. He believed the competition between what is new and novel with the old and cheap would show an advantage for the former type of goods.

While much the same problems confront the manufacturer of producer goods, there are additional ones which may cause him to lag in the recovery. One way out, Mr. Chevalier stated is the obsoleting of every piece of old equipment in a plant to insure lower costs and higher efficiency. To the welding industry, this means new designs.

Remodeled Sheet Mill in India Meets Expectations of Increased Output

TATA IRON & STEEL CO. LTD., Jamshedpur, India, recently started to operate a remodeled unit of its sheet mill. Remarkable results are reported

The original sheet mill, in operation since December, 1924, consisted of seven double mills—seven roughing and seven finishing stands in train—driven by a 1500-horsepower 250-revolution-per-minute induction motor through a gear reducing set. The mill was built by United Engineering & Foundry Co., Pittsburgh.

To increase production and lower operating costs, the Perin Engineering Co., New York, consulting engineers for the Tata company, recommended certain alterations and additions of mechanical equipment and F. L. Estep, its vice president, with the co-operation of the plant management in India, is responsible for the plan finally adopted.

One unit of two roughing and one finishing stands, with provisions for a second similar unit, were cut loose from the existing line of mills and are driven at approximately 25 revolutions per minute by a 2300-horsepower 375-revolution-per-minute motor taken from another mill through a double reduction gear set built by the Mesta Machine Co., Pittsburgh. A continuous double-width furnace of the Wean Engineering Co. Inc., Warren, O., heats the bars for the two roughing stands.

Transferred to Pack Furnace

After being hand roughed in pairs in the necessary number of single and matched passes to about No. 16 gage, 1½ pairs are matched in packs of threes and transferred to the charging end of a Wean double-width continuous pack furnace. They are given one or two runover passes, doubled into a pack of sixes, returned to the charging end of the pack furnace and, after being heated, given the necessary finishing passes.

The finishing stand is equipped with a set of Wean automatic feeder and catcher tables. The finished hot-rolled sheets pass from the catcher table over a short conveyor to a cooling conveyor and to the squaring shears, and from there to other operations, as annealing, pickling, galvanizing and corrugating, as required. All movements of material are automatic over gravity or driven conveyors and handling is reduced to a minimum.

The intention was to concentrate on the new unit rolling of 24-gage sheets, 36 inches wide and 8 or 10 feet long for corrugating, this being the product for which there is the greatest demand in India.

Production Exceeds Hopes

Results obtained with this new unit not only came up to the predictions of Mr. Estep but exceeded them. The original hot mill, seven double mills of which normally six were in operation, produced in 1932 a total of 56,068 gross tons of black sheets in 5237 shifts of 8 hours, or an average of 10.7 tons per mill per shift. The gages ran from 10 to 24, inclusive, with a weighted average of 20. Three of the mills which rolled almost exclusively 24 gage averaged close to 10 tons.

Expenditures for the remodeling had been authorized upon Mr. Estep's statement that, if his recommendations were followed, he expected an average production of 30 tons per mill per shift on the new unit. After three weeks of regular operation, with all the miscellaneous adjustments invariably to be made on a new installation and with a crew consisting almost exclusively of native Indians, the new unit produced during the week ending March 25 in 16 shifts an average of 30.175 gross tons per shift, with one shift rolling 40.946 tons, all 36 x 96-inch x 24 gage sheets, except for the necessary heavier gages for warming up new rolls Mondays and Thursdays.

After having accustomed themselves to the mechanical operation, latest reports state that one shift produced on April 26 46.83 tons, and in 24 consecutive hours 123.84 tons, or an average of 41.28 tons per shift. It should be noted that the standard 24-gage of the Tata company is somewhat lighter than the United States gage, weighing only 0.92 pounds per square foot.

Develops New Bronze for Structural Applications

A new bronze, suitable for structural purposes because of its high tensile strength, hardness and resistance to corrosion from many chemicals, has been announced by the Chase Brass & Copper Co., Waterbury, Conn.

This new material, designated as Olympic bronze and developed by Dr. D. K. Crampton, director of research, Chase Companies Inc., Water-

Attention - SHEET *and* STRIP MANUFACTURERS *and* CONSUMERS

Here is a method of rendering sheets free from stretcher strains! It gives results far beyond those produced by ordinary roller leveling practice and provides sheets and strip that retain their drawing and stamping qualities *much longer* without the formation of stretcher strains.

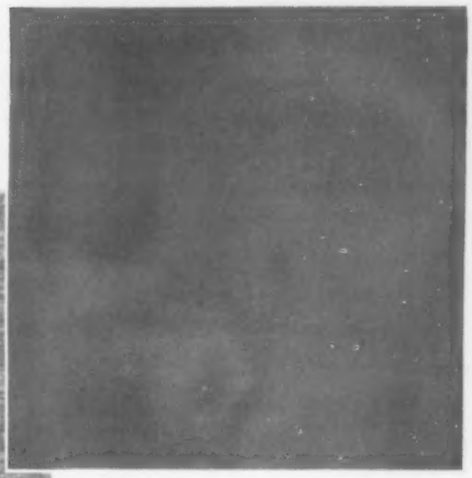


Fig. 3

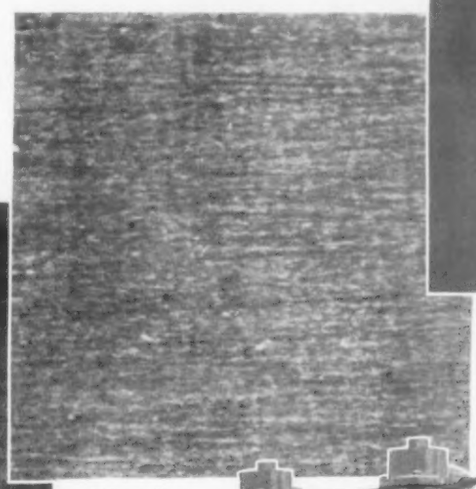


Fig. 2

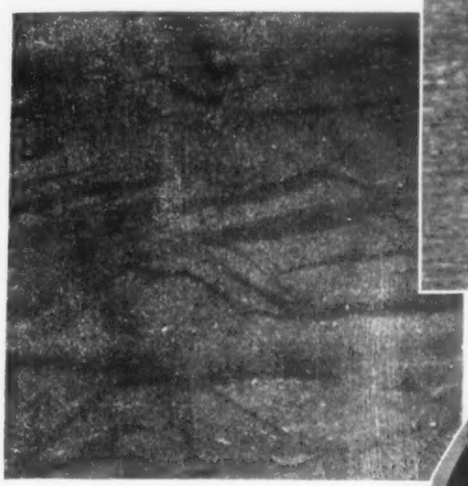


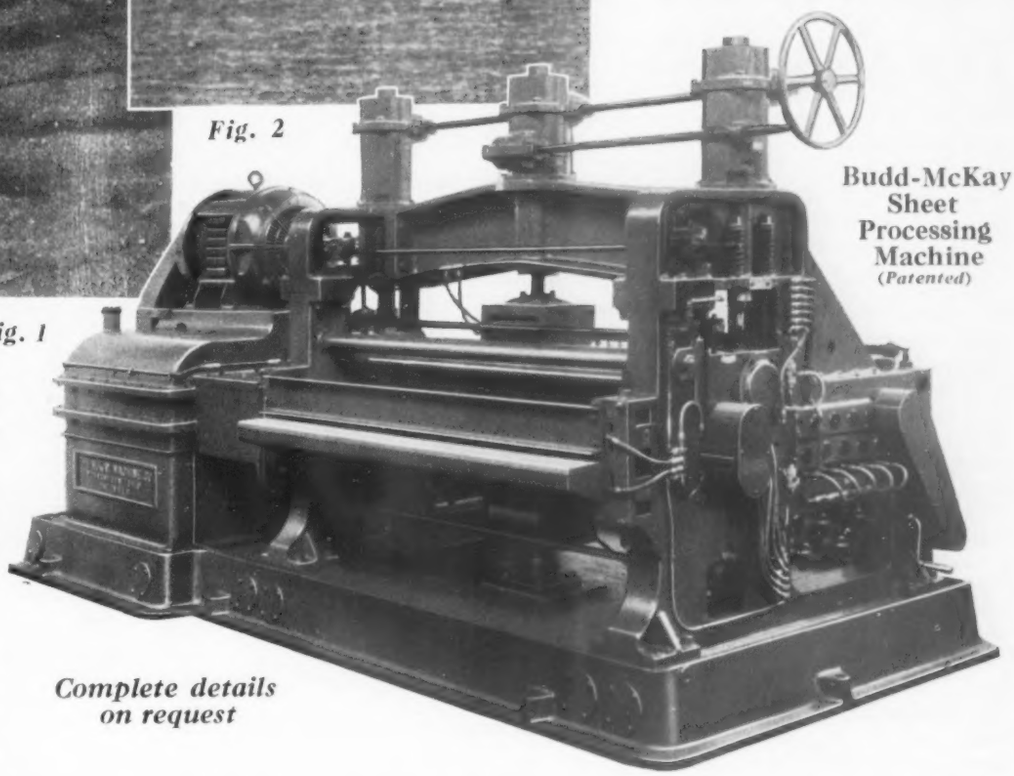
Fig. 1

The above photomicrographs are samples of box annealed sheets from the same heat and drawn the same amount.

Fig. 1—An auto body sheet, box annealed as the last operation. Note heavy stretcher strains.

Fig. 2—Full finished sheet showing age strains.

Fig. 3—Sheet fully processed by the Budd-McKay machine. Note steel has been rendered free from strains and has original drawing qualities.



Budd-McKay Sheet Processing Machine *(Patented)*

Complete details on request

THE McKAY MACHINE COMPANY

Engineers and Manufacturers of

SHEET, TIN AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

Associated Company

THE WEAN ENGINEERING CO., INC. WARREN, OHIO

bury, Conn., was described in detail for the first time May 1 by Harry P. Croft, metallurgist, Chase Brass & Copper Co., Cleveland, in a lecture on "Manufacture and Metallography of Brass and Bronze" presented in connection with the modern metallurgy course of the Cleveland chapter of the American Society for Steel Treating.

The alloy contains 96 per cent copper, 3.00 per cent silicon and 1.00 per cent zinc. It is easily cast, cold or hot worked and welded. Hardness ranges from 109 to 228 brinell.

Wire suitable for cold heading into rivets has a tensile strength of 100,000 pounds per square inch and an elongation of 20 per cent in 2 inches. It may be produced with tensile strengths considerably in excess of this with corresponding decrease in ductility.

Stainless Meeting Proves Popular

THE broadening application of stainless steel to a large variety of products was revealed in New York, April 26, at a joint meeting of local sections of five engineering societies. More than 850 listened to three speakers, prominent in the field, discuss the various aspects of stainless steel—its development, application and future prospects.

Between 1500 and 2000 visited the exhibit of stainless steel products held throughout the afternoon and evening. More than 50 companies were represented with displays.

Special significance was attached to the presence of George H. Charls, secretary of the American Iron and Steel institute, as presiding officer. This was a departure and, as Mr. Charls himself declared, reflected a change in policy of the institute following reorganization by Robert P. Lamont, president, toward promotion of the uses of steel.

Applications Are Universal

Commenting upon the use of stainless steel, Mr. Charls said the question now is "where aren't the possibilities, rather than where they are." A steel man of long experience, he had seen the field grow.

Principal speakers were Dr. Marcus A. Grossmann, research engineer, Illinois Steel Co., Chicago; Dr. F. M. Becket, president, Union Carbide & Carbon Research Laboratories Inc., New York, and president, American Institute of Mining and Metallurgical Engineers; and Dr. W. M. Mitchell, metallurgical engineer, subsidiary companies of the United States Steel Corp., New York. A special feature was a motion picture of the construction and operation of the Budd stainless steel rail car.

Dr. Grossmann devoted his remarks largely to the development of stainless steels. Dr. Becket spoke particularly of the heat-resisting steels, and declared that the development had created new processes and equipment not previously known. The work in stainless steel has highly benefited every branch of engineering, he said.

In discussing the uses and applications of stainless steel, Dr. Mitchell approached the subject from the point of the reasons underlying the applications. He warned consumers not to regard the use of stainless steel as a panacea for all difficulties, but to study their problems closely that the right kind of stainless steel may be used for the right purpose. Touching on the question of cost, he said that cost should be considered in terms of service and not from the standpoint alone of the purchase price. Stainless steel always will cost more than the common grades, but large economies in the long run can very often be effected in its application, he said.

New Alloy Is Resistant To Hydrochloric Acid

Development of a new alloy, which is claimed to be almost entirely resistant to hydrochloric acid at all concentrations and all temperatures up to the boiling point, is announced by the Duriron Co. Inc., Dayton, O.

Hydrochloric acid, widely used commercially, is one of the most vicious acids for attacking metals, and heretofore the only metals for complete resistance have been very costly.

The new alloy, tradenamed Durichlor, is said to be comparatively inexpensive and is being used to make pumps, valves, pipe, fittings, jets, and other pieces of chemical handling equipment.

New Screen Metal Resists Corrosion and Staining

Manufacturers of wire cloth have begun the production of a new type of screen for household purposes, which, it is indicated by a long series of tests in the laboratory and under actual service conditions, will resist discoloration and corrosion. It requires no paint and is claimed to practically eliminate maintenance cost.

The screen is made from Inconel, a new alloy manufactured by the International Nickel Co., 67 Wall street, New York, and containing approximately 80 per cent nickel, 12 to 14 per cent chromium, and about 6 per cent iron (STEEL, Jan. 30, page 26).

Originally developed for use in the construction of certain items of dairy equipment exposed to the corrosive action of lactic acid and brine, it has been found to be almost entirely proof against staining, corrosion, or other deterioration from atmospheric conditions. It is silvery white in color and when drawn into wire it possesses tensile strength more than sufficient for the requirements of wire fabric.

Hollow Metal Lath Partitions Described in Catalog

A new and simplified method of building light-weight fire-safe partitions to meet the demand for steel frame construction at low cost is described in an 18-page illustrated catalog recently issued by the Consolidated Expanded Metal Companies, Wheeling, W. Va.

Known as Bar-Z partitions, the units comprise four simple elements —studs, track for floor and ceiling, shoes for attaching the studs to the track, and reinforcing metal lath. Studs are 16-gage steel with substantial flanges, punched out to form a truss-like design. Set on 24-inch centers the studs are covered with a reinforcing diamond mesh lath which has solid steel ribs welded to both sides at 7-inch intervals. The lath is claimed to form a rigid plaster base, obviating the necessity for a thick coat of plaster.

Copies of the catalog mentioned above are available upon request to the company.

Machinery Group Elects

Holding its annual meeting in Chicago, April 26, the American Machinery and Tools institute elected the following officers: President, E. R. Prout, Teletype Corp.; vice president, Frank Quick, Management Service Co.; treasurer, Craig B. Hazelwood, First National bank; and secretary, George R. Tuthill, 40 North Wells street, Chicago.

Newly elected directors are W. R. Mau, Vanadium Alloys Steel Co.; J. S. Kozacka, Lewis institute; F. B. Coyle, International Nickel Co., New York; S. B. McHenry, William D. Gibson Co.; and A. C. Wais, Niles Tool Works Co.

With the exception of Mr. Coyle, all officers and directors are located in Chicago.

The Leningrad Paper institute, Leningrad, Russia, collaborating with the Metal institute, is reported to have discovered a process for manufacturing acid-proof bronze, until now unknown in the USSR.

Alloy steel and iron bear the brunt

The past decade's revolutionary advance in the application of high speeds, high pressures, and high temperatures to mechanical production and chemical processes has necessitated the working out of a tremendous number of alloy steel and iron analyses, each designed to meet some specific requirement of this new age.

High strength at high temperature . . . high strength combined with light weight . . . complete resistance to corrosion under varying conditions . . . increased wear resistance . . . immunity from the effects of shock and fatigue . . . these are but a few of the manifold demands that are met daily by the proper use of Ferro-Alloys.

Any metal part used in your product or equipment can be benefited by some one or more of the inherent advantages of Ferro-Alloys. It will pay you to investigate thoroughly the latest developments in high temperature metallurgy and to let Electromet Engineers explain how required physical and chemical properties may be provided by the use of Ferro-Alloys.

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Ferro-Alloys & Metals

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part V—Open-Hearth Furnace Lines

(Thirty-First Article of Series)

IF NATURAL draft and cold fuel is the practice then A_6/A_2 should nearly equal 1.0 to permit an easy and free flow of air in the uptakes. A ratio of less than 1.0 may curtail sharply the operating speed. If forced or mechanical draft is employed the foregoing remarks are not particularly pertinent so far as they apply to air delivery.

Ratio A_5/A_2 which is that of the total combined area presented for the entry of the waste-furnace gases into the downtakes to the knuckle never should be less than 1.0 for freest and most economical operation, because an increase of velocity at the point of downtake entry besides exerting a throttling effect tends to cut away end and side walls and the bulkheads excessively.

The increase of this ratio to considerably over 1.0 tends towards a faster working furnace and materially lower upkeep costs. Too small a ratio A_5/A_1 is more frequently encountered in furnaces in which capacity of the bath has been increased since original construction. If a waste-heat boiler is included, which is the case in most of the furnaces under consideration, the induced draft fan always a part of such an installation actually exerts some favorable influence in the downtakes; this action is uncertain and irregular and should not be counted upon. If an induced draft fan is used without a boiler as in the Isley system the foregoing remarks do not apply and the ratio A_5/A_2 safely may be less than 1.0.

Involves Three Factors

The true measure of the effectiveness of the areas of Table LIII will be in a comparison of the fluid velocity through them under actual operating conditions. The attempt will be made to determine these. In order to accomplish this three principal factors in addition to those of area are involved. First, the operating records of the furnaces from which fuel rates may be computed; second, certain combustion data from which the fluid volumes passing through the furnaces may be calculated; and, third, an estimate of the temperatures of the various gas components of the combustion at the critical points so that by giving effect to temperature the velocity of the gases under standard conditions may be computed. These factors will be considered in the order stated.

The operating data, which forms a basis for this further study, is given in Table LV. The absence of a number of heats reported indicates that available data are incomplete and that the figures used are estimated conservatively.

Tar, fuel oil or coke oven gas are fired selectively as may be most expeditious in furnaces C, D, F, H, M and P. Fuel designated as "used" is the fuel preferred by the operating men. Figures included in the columns of Table LV under the designation of time of heats, tons of ingots per heat and B.t.u. per ton are based on a sufficient number of heats to make operating data truly representative of the practice of the particular shop. In many cases accounting department operating logs of the performances of the furnaces have been submitted as a basis for the figures. In a few cases logs covering several heats or perhaps a month of favorable operations have been submitted but these have not been used. These in some instances have developed figures as low as 3,000,000 B.t.u. per ton of ingots.

As usually reported in American practice the B.t.u. values of fuel per ton of ingots require modification to be truly comparative, one with the other. The following comments and explanations are pertinent to this subject. While the high values of hydrogen are used in the majority of cases, low values, which are preferred are sometimes used. However, high values of hydrogen have been here used without exception. Excepting in the case of producer gas, the fuel charged is that actually entering the furnace.

Producer gas-fired furnace records usually are reported as "pounds of coal fired in the producer." Given the weight of coal fired, its calorific value and the hot gas efficiency of the producer the heat actually entering the furnace then may be found. However, as the steam required in gasmaking is not usually reported, representing from 3 to 4 per cent of the total calorific value of the fuel, the reported fuel rate of the producer-fired furnaces is low to this extent.

The value of the steam used to preheat and to atomize oil or tar, and which is of the same order as in the gas producer, seldom is reported as fuel input which it should be. Thus it will be deduced that coke oven, natural or mixed gas, which do not require extraneously added heat for their making, preheating or combustion, are handicapped several per cent through the method of reporting fuel records.

Whenever forced draft is required or used as an adjunct of combustion, seldom if ever is the electrical energy required for the compression and movement of the air reported as a component of fuel input to the furnace, though it should be.

If induced draft is used as an ad-

Table LV

Operating Data of Various Open-Hearth Furnaces

Furnace	Fuel used	Number of heats reported	Average time of heats tap to tap, hrs.—min.	Average tons ingots per heat	B.t.u. fired per gross ton
A	Producer gas	Over 50	12 — 0	150.0	5,393,300
B	Fuel oil	318	12 — 35	119.8	4,947,000
C	Fuel oil	.....	9 — 0	110.0	4,000,000
D	Coke oven gas	600	12 — 58	113.8	5,250,000
E	Fuel oil	210	13 — 59	154.0	5,112,000
G	Mixed gas (cold)	704	11 — 25	132.0	4,500,000
H	Fuel oil	547	12 — 18	123.0	5,147,000
I	Fuel oil	600	11 — 0	180.0	4,500,000
J	Producer gas	Over 100	12 — 10	155.0	4,839,800
K	Producer gas	Over 100	12 — 0	158.0	4,537,300
L	Mixed gas (preheated)	.....	11 — 30	150.0	4,700,000
M	Coke oven gas	550	16 — 53	215.6	4,881,000
N	Producer gas	Over 50	15 — 30	250.0	5,049,000
O	Producer gas	Over 50	16 — 30	300.0	4,876,900
P	Coke oven gas	115	17 — 12	220.0	5,014,000

junct to waste-heat boiler operation the energy for the operation of the fan is not chargeable to the furnace fuel. If an induced draft fan is employed as an integral unit of a combustion system, such as the Isley, the energy required for its operation is most certainly chargeable to the furnace fuel.

The foregoing remarks do not apply to the few open-hearth system heat balances that have been made, for in these the various factors have been distributed properly.

The usually quoted, pounds of coal, oven or mixed gas are, cubic feet of gas per ton of ingots multiplied by the appropriate calorific value. From the foregoing it will be evident that the values of Table LV used for producer gas and the liquid fuels are actually but 96 or 97 per cent of the real fuel consumption.

This explanation is made in the interest of accuracy and in the hope that it may focus the attention of the operators on the faultiness and unfairness of the present method of reporting fuel consumption and bring about a standardized method that produces a considerable proportion of ingot iron which is tapped at a temperature about 100 degrees higher than low-carbon steel and requires perhaps an hour additional refining time. If based on the manufacture of low-carbon steel only it is probable that the time of heat would be under 12 hours and the B.t.u. reduced about 7 per cent or to perhaps 4,600,000 B.t.u. per ton of ingots.

Furnace J, while producing some low-carbon steel has been used principally to make various alloy steels,

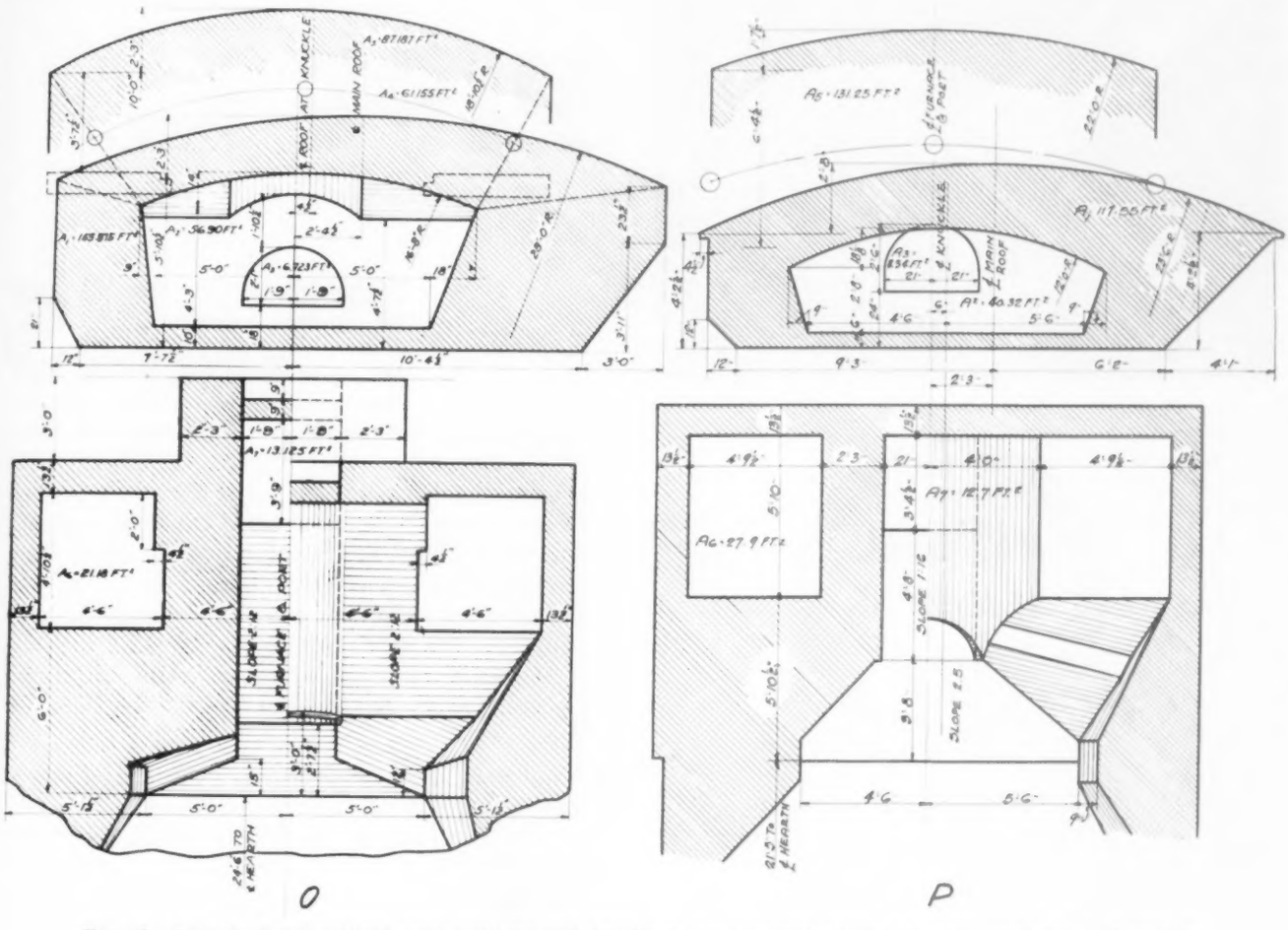


Fig. 45—Principal and critical cross sections and details of uptakes and throats in plan of furnaces O and P

gallons of liquid fuel or cubic feet of gas are apt to be misleading as a criterion of the practice and efforts should be made looking to a standardized and equitable method of reporting fuel practice.

Of the producer gas-fired furnace records in Table LV the fuel values quoted are pounds of coal fired in the producer per ton of ingots multiplied by the calorific value of the coal multiplied by the hot gas efficiency of the operation. The values used for the liquid fuel are, gallons or pounds of liquid fuel per ton of ingots multiplied by the calorific value of the fuel. The values as used for coke will be representative of the practice without the necessity of qualification.

The values of Table LV are presented at this time because they form the basis of further calculation for the determination of certain gaseous fluid volumes. Used for this purpose, the discrepencies previously discussed do not constitute inaccuracies of importance.

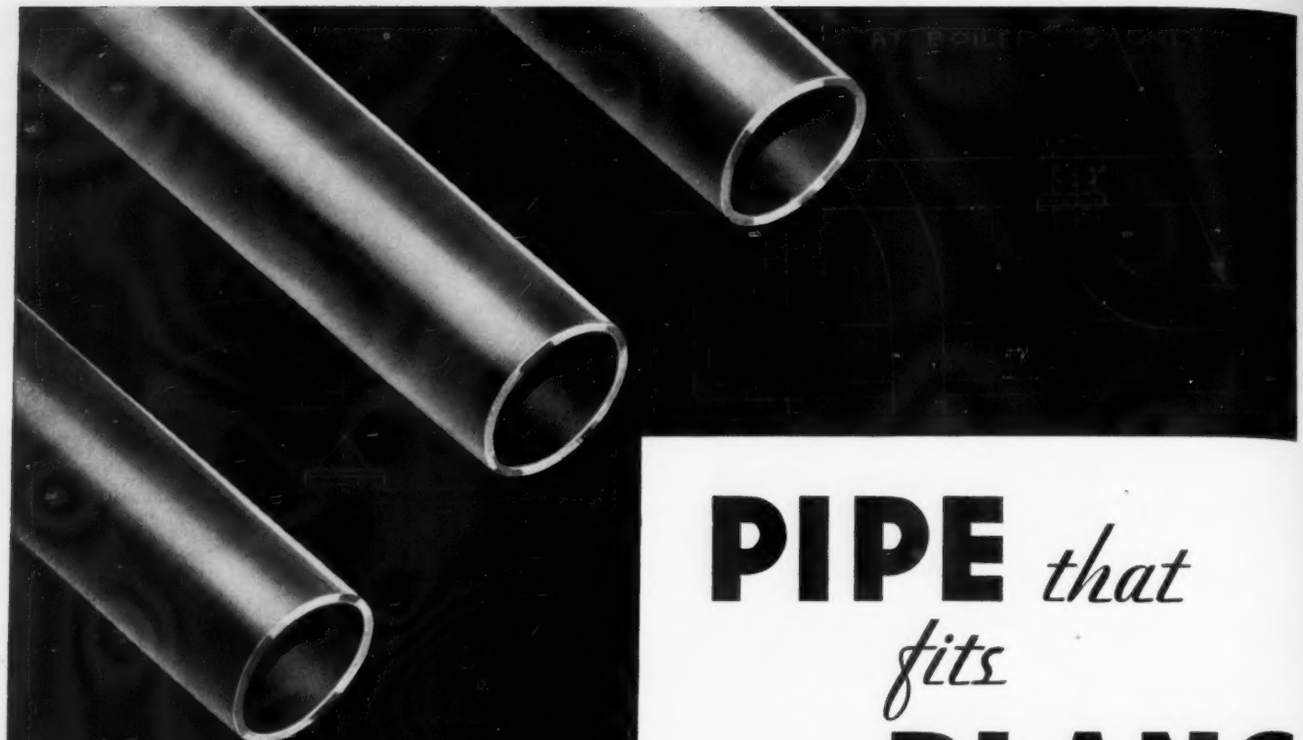
With two exceptions, the records of the furnaces of Table LV are taken from the production of low-carbon (0.10 to 0.20) steels, and the general practice is similar. Furnace B, while producing some low-carbon steel, also which tends to increase both the time of heat and the fuel consumption.

(To be Continued)

Metal Trades Association To Meet in Chicago

The National Metal Trades association will conduct its thirty-fifth annual convention at the Congress hotel, Chicago, June 8.

Among subjects to be discussed are forces behind social legislation, the farm outlook, unemployment insurance, old age pensions and the economic outlook.



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Whatever the anticipated pressures and temperatures that it may be called upon to withstand, NATIONAL Seamless Pipe can be depended upon to fit your plans. Uniform strength and adaptability to fabrication are outstanding advantages of this modern product of the largest manufacturer of tubular goods in the world. Being seamless—no welds—there is no line of possible weakness in it, lengthwise nor in any direction, for each length has been pierced from a billet of solid steel.

NATIONAL Seamless is workable and accommodating where bends have to be made and can be readily used with any kind of joint; flanged without injury, welded with ease. Power plant designers and engineers, in using NATIONAL Seamless Pipe, find altogether new measures of adaptability, satisfaction, and safety. Whatever your plans, this pipe will fit them. When specifying seamless, insist upon NATIONAL—

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NATIONAL TUBE COMPANY · Pittsburgh, Pa.
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WALLS WITHOUT WELDS
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STRONG · SAFE · UNIFORM

CHECK THESE ADVANTAGES

- ✓ *Seamless—no welds.*
- ✓ *High tensile strength.*
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- ✓ *Made from superior quality Open Hearth steel.*
- ✓ *Complete range of sizes, wall-thicknesses and lengths.*
- ✓ *Readily adaptable to any type of joint.*
- ✓ *Proved performance under exacting service.*
- ✓ *A product of the largest manufacturer of Seamless Pipe.*

NATIONAL SEAMLESS

PIERCED FROM SOLID BILLETS - NO WELDS

Placing Long-Idle Leather Belts Back Into Service

By J. N. SMITH
Engineering Department, E. F. Houghton & Co., Philadelphia

DURING the past two years many plants have "robbed Peter to pay Paul" to keep machines running. Belting has been taken off equipment temporarily shut down and used on other drives where belts were needed, with the result that when the superintendent receives orders to start production, he frequently finds belts missing. At the same time, many plants have dozens of belts which have stood idle for some time, exposed to the effects of atmosphere and age.

Before this belting is put back into service it should be inspected carefully and reconditioned if necessary. Belting often deteriorates more rapidly when idle than when in use. Many things can happen to an idle belt and invariably it will require some attention to place it in first-class condition, acceptable for efficient service.

A few conditions which should be checked are: Is the belt saturated with oil or covered with dirt; are there any open laps; is the length correct; are fasteners worn or broken; and are the pulleys properly aligned?

If belts have become soaked with mineral oil, degrease them by soaking in gasoline or carbon tetrachloride for 24 hours, or longer if necessary. In doing this it must be remembered that the degreasing not only removes all mineral oil but also the natural oil which is essential to lubricate the fibers of the leather. Therefore, after the belt has been thoroughly degreased, dress it with a good belt lubricant to lubricate and preserve the fibers.

Do not use a sticky belt dressing as it will not lubricate the leather. Never permit foreign matter such as lumps of belt dressing, dirt, wood chips or adhesive material of any kind to gather on the belting or pulley faces. Clean the belt off by scraping with a dull edged scraper with rounded corners. Do not use a sharp scraper as the fibers must not be injured.

Check all the laps and see that they have not started to separate, especially the tip of the lap. If it is found necessary to re-cement a lap, be sure to scrape off all of the old cement. The laps then should be thoroughly roughened up, either with coarse emery cloth, a rasp or wire brush before the cement is applied.

A belt which has been left under tension on an idle drive probably has become permanently stretched. Therefore, it is wise to remove the belt from the drive and shorten it to the proper length to give the desired tension. If the drive is to be idle for some time, do not install the belt on the drive tight; it is better not to install the belt at all until it is needed.

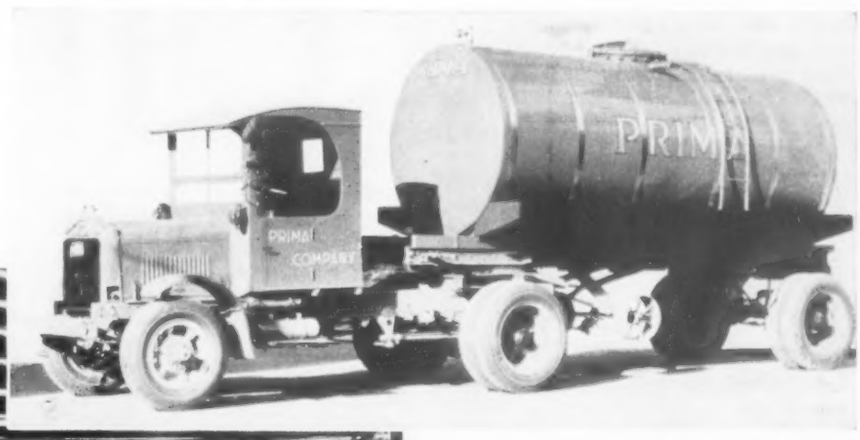
Check on Fasteners

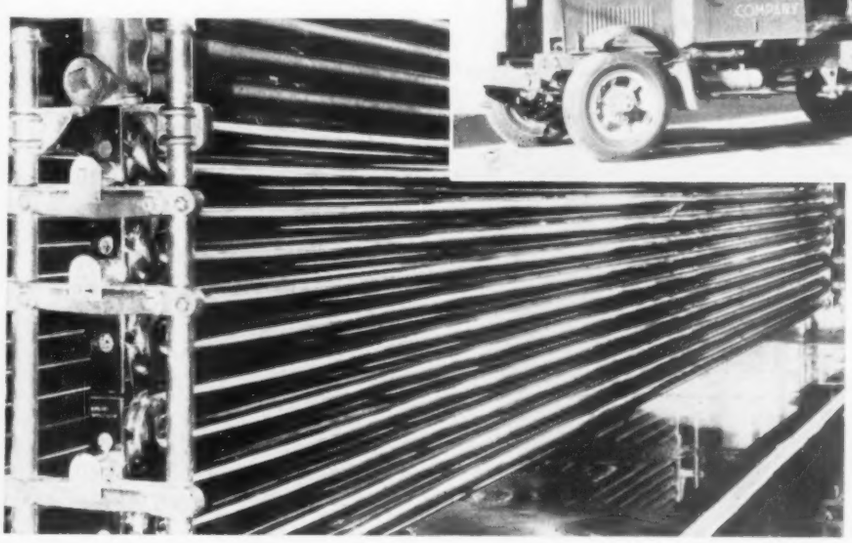
Fasteners of all types should be gone over carefully. If any of them are either worn or broken they should be replaced immediately. A worn fastener is liable to let go at any time and a broken fastener will not only cause the belt to run crooked but will also damage wood or composition pulleys.

Pulley alignment is very important from the standpoint of belt life and transmission efficiency as well as the operator's safety. It should be checked carefully during the belting inspection.

The application, maintenance and repair of belting should be in the hands of a competent man trained in this service. Many good belts have been ruined by incompetent repairs. If the plant does not have the facilities for properly reconditioning belting, any reliable belt manufacturer can perform this work.

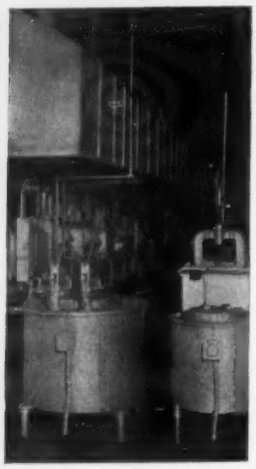
BREWERIES APPROVE STAINLESS: Two new applications of 18-8 stainless steel in the manufacture and distribution of beer are shown here. At the right a 3000-gallon beer transport tank for hauling beer from brewery to branch bottling plant. The tank is of 10-gage stainless steel, supplied by the Republic Steel Corp., Massillon, O. All seams are welded and





interior surfaces are polished. Over the steel tank is a 2-inch layer of cork insulation and an outer jacket of 14-gage aluminum. Built for 25-pound delivery pressure, the tank is of one of several supplied to the Prima Co., Chicago, by Groen Mfg. Co. Inc., Chicago. At the left is a 24-foot two-surface ammonia beer cooler, assembled of 2⅜-inch electric welded stainless steel tubing, by the York Ice Machinery Corp., York, Pa. Steel & Tubes Inc., Cleveland, fabricated tubing for the cooler, which is installed in Kings Brewery Inc., Brooklyn, N. Y.

Making the Most of



METHODS AND MATERIALS

USE of high-strength steel in shipbuilding has been launched in Europe. The new French liner, NORMANDIE, and the new Italian liner, CONTE DI SAVOIA, are the first of a number of new European liners to have hulls constructed in whole or in part of high-strength steel. By using this material, the non-revenue load is reduced, giving a vessel additional capacity for pay load. The value of high-strength steel for lightening ship construction has been stressed in the United States for a long time, but little has been done about it.

\$ \$ \$

A machine tool builder uses a tantalum carbide tool for facing the teeth, rim bosses and hub of a 13.5 per cent manganese steel sprocket. This steel is extremely hard and difficult to machine using ordinary cutting tools.

\$ \$ \$

Use of nickel steel parts has saved 30 to 40 per cent in weight of mine cages used by the Cie. des Mines de Roche-La Moliere in France without sacrifice of strength.

\$ \$ \$

EXCELLENT adhesion and flexibility with fast-drying characteristics are claimed for a new pyroxylin enamel which gives not only a durable finish but an economical one, because the priming coat can be eliminated. One coat can be built up to greater thickness than with other pyroxylin enamels. According to the manufacturer, the enamel dries dust-free in 15 minutes and is dry to handle in 1 hour; in 7 hours it is ready to pack and can be recoated in 1 hour. Forced drying, 1 to 2 hours at 150 degrees Fahr., greatly accelerates hardening of the film and allows handling and packing in even a shorter time. Applied to any bare metal surface, it gives a finish which is vastly superior in initial and retained flexibility. It ranks high in hardness and print resistance tests and the film has good resistance to alcohol, gasoline and water. Its viscosity permits it to be sprayed at a 50-50 reduction and in one application can be piled up without sacrificing chip resistance. Although the enamel has a natural high gloss, buffing and polishing makes it remarkably smooth and lustrous. Thirty-six standard colors are available.

\$ \$ \$

The most effective way to obtain complete, thorough, and continuous distribution of a sufficient volume of low-temperature heat to all parts of furnace work is to provide positive circulation and recirculation of air heated to the correct temperature. A furnace which accomplishes this and which is both ingenious in design and effective in utilization has been installed in a Detroit automobile plant.

This unit is employed in drawing steel gears at 400 degrees Fahr. and requires a heating period of 2¼ hours. Consisting of a sheet steel shell lined with fire brick, this furnace is 30 feet long and the hearth slopes at an angle so that the work will pass through by gravity. Racks with upright spindles on which the gears are stacked are mounted on casters, and these roll along the hearth from charging to discharging end. At each end of the furnace is a pair of steel plate doors, just far enough apart to hold one rack, and these form a vestibule which prevents infiltration of cold air or escape of heat, while charging and discharging. The heater is mounted on top the furnace close to the charging end and consists of a sheet steel shell lined with fire brick. It is 10 feet long and 3 feet square. Heat is supplied by a single gas burner in one end. A duct runs from the top of the heater and enters the furnace through the top. A motor-operated fan, cut into the duct, pulls the hot products of combustion from the heater and forces them into the furnace, where they flow toward the charging end.

\$ \$ \$

Assembly of cast-iron cylinder liners into the bores of an engine block is being facilitated by cooling the liners to a temperature of 109 degrees Fahr. below zero with dry ice. Liners placed in a refrigerator for 16 minutes shrink 0.006-inch in diameter. They are placed in the bore immediately after being taken from the refrigerator and almost instantly exert a heavy pressure on the sides of the bore as they expand to their normal diameter.

\$ \$ \$

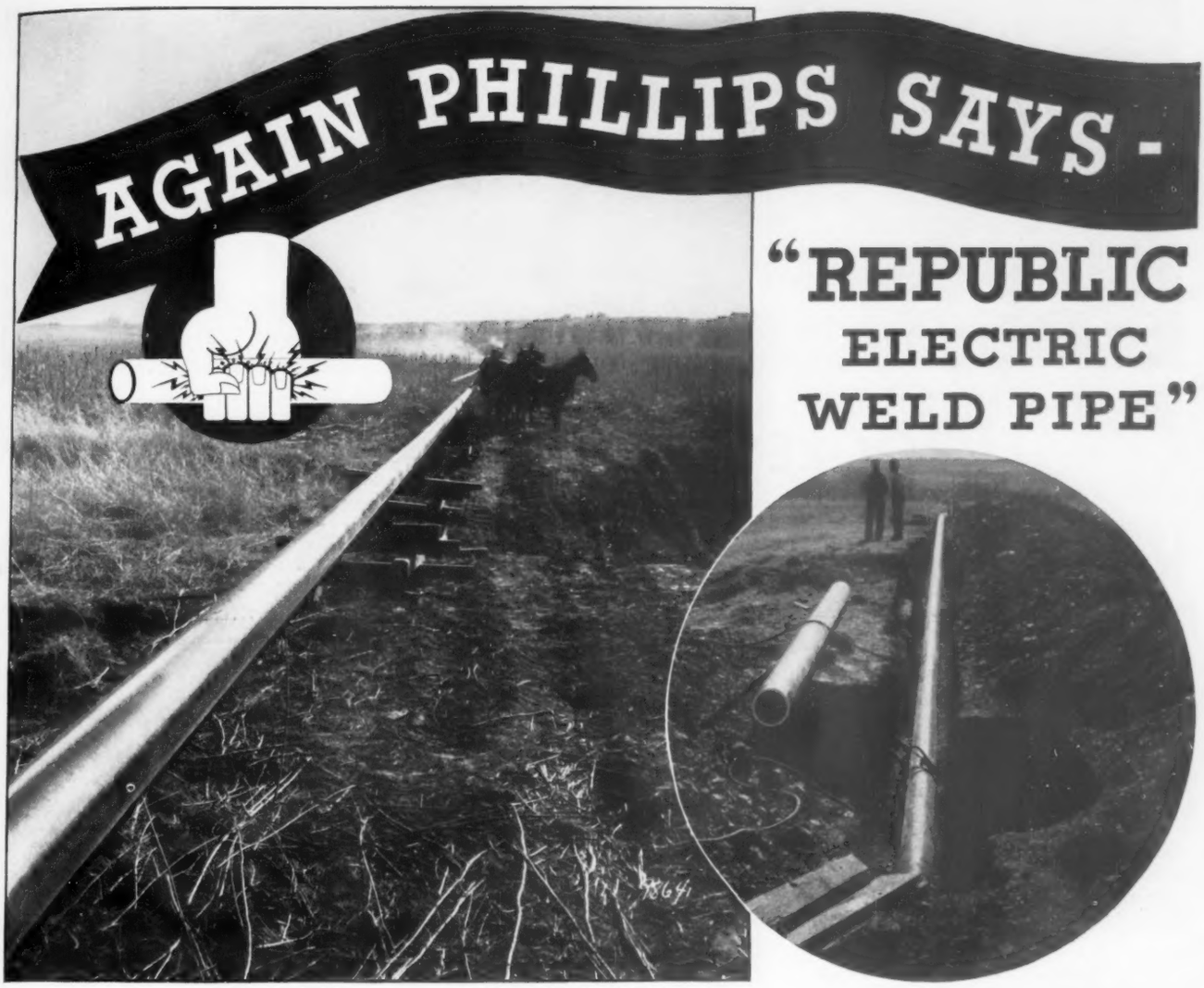
MACROETCHING or deep acid etching has become increasingly important in recent years as a method of testing tool and special alloy steels for internal and in some cases surface defects. It is applied mostly to annealed bar stock. Records of one large steel manufacturer over a period of almost three years show of the routine tests going through the physical laboratory 15.5 per cent are deep etch tests, representing about 300 tests per month. Of material thus tested rejections run about 5 per cent.

\$ \$ \$

A Middle West welding company was awarded the job of repairing the frame of a 12-ton press which had broken at the crankshaft bearing. The section to be welded was approximately 14 inches in thickness. About 250 pounds of welding electrode was used and the total cost of the job amounted to only one-eighth of the cost of a new frame, a saving of over \$2000.

\$ \$ \$

A lumber company checked up and found it was burning daily \$60 worth of scrap lumber to supply steam for its main lineshaft drives. At a cost of \$10,000 it scrapped the antiquated steam equipment and installed electric motors. The net annual saving is \$9000.



The Phillips Petroleum Company's earlier experience with Republic Electric Weld Line Pipe was in the 550-mile gasoline line extending from Borger, Texas to Kansas City and St. Louis, Mo. And it was their experience in the construction of this line and its satisfactory operation ever since completion that led to the use of the same kind of pipe recently in the 200-mile oil line from Oklahoma City to Eureka, Kansas.

In other words, Republic Electric Weld Pipe is its own best salesman. Its advantages are many and immediately apparent. Long lengths—they average 46 feet on the Phillips Line—save many field welds, cut down cost and speed up construction. Uniform wall thickness and perfect roundness also make for better and quicker welds. Freedom from scale, inside and outside, means a cleaner product at the delivery end of the line, in some instances eliminating re-runs.

More than 7000 miles of Republic Electric Weld Pipe is now in service—every mile paying profits on the foresight of some organization that could only be satisfied by the best. Write today for this book that tells the story—"Catalog 210-B."

REPUBLIC STEEL
CORPORATION
GENERAL OFFICES: YOUNGSTOWN, OHIO

PROGRESS IN STEELMAKING

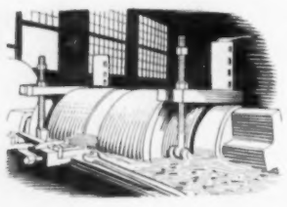
RECLAMATION of free iron from blast furnaces or open-hearth slag now may be accomplished mechanically. The machine for effecting this recovery is built with a spinning pot mounted on a vertical motor on the interior of a retaining shell. Water sprays are provided in a sufficient number so that the slag, free of iron as it leaves the lip of the pot, is granulated. Rings of iron recovered from the pot after a run of slag will vary from a small chunk up to pieces weighing from 1½ to 2 tons. In one case after a 15-minute flush, 2½ tons of metal was recovered although no iron apparently flowed beneath the slag.

♦ ♦ ♦

Introduction of a machine, which operates on the principle of the pantograph, permits the cutting of decorative designs in steel sheets in thickness up to 18 gage.

♦ ♦ ♦

Use of a trisodium phosphate solution at a wire mill in Illinois to neutralize the acid left on the surface of rods following the pickling process has permitted the company to dispense with the baking process which usually is required when lime is employed for this purpose. Occluded hydrogen is avoided by the use of an inhibitor in the phosphate solution.



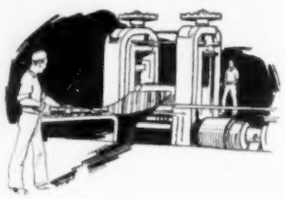
BODIES of chilled iron rolls having a sclerescope hardness of 58-61 are being machined at a plant in the Pittsburgh district at a speed of 30 feet a minute with a 3/16-inch longitudinal feed and ⅛-inch depth of cut. The necks are turned at a speed ranging from 9 to 30 feet a minute depending on the hardness of the material. The roll lathe is built with two carriages and permits turning the necks and bodies without changing the initial setup.

♦ ♦ ♦

High-photographic contrast of steels at high and low magnification is claimed for a new photographic plate designed for photomicrography of metal specimens. The plates are not sensitive to red light, thus facilitating freedom in darkroom handling.

♦ ♦ ♦

Coating the stems of gate valves on exterior pipe lines at blast furnaces and steel plants with petrolatum affords protection against corrosion and contributes to easy operation of valves when the occasion arises.



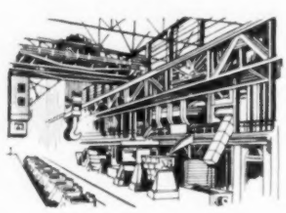
ONE of the most recent applications of steel sheets is for laminated gears and gear blanks. These are fabricated of many thin-gage sheet sections, coated with graphite and assembled under tremendous pressure. The product has the appearance of a ground steel gear of ordinary construction, gives silent service, is self-lubricating, and can either be made to run in mesh with each other or mated with any gear commonly used for silent pinions.

♦ ♦ ♦

Cohesion and quality of the chromium plating on the surface of steel tubes is improved if the tube is heated by induction to 1832 degrees Fahr. or over, according to the practice of a steelmaker in the Pittsburgh district. Tubes to be brought to this temperature are passed through a relatively short inductor coil where they are regularly and controllably rotated and advanced at an adjustable speed by revolving asbestos board disks on which they rest. The inducing current is supplied at 960 cycles from 150-kilowatt high-frequency generator equipment.

♦ ♦ ♦

Preservation of the bright surface of steel sheets, goods or parts in storage or in transit, and particularly on export shipments, may be had by the application of a rust-preventative fluid recently marketed in this country but employed for many years by British exporters. The fluid is applied with a brush, spray, felt rollers or by immersion in a bath. The coating, it is claimed, will not harden or gum so as to be difficult to remove, and as it has a lubricating value, it need not be removed from moving parts after assembly. Should removal be necessary, however, a rag dipped in kerosene and rubbed over the surface will eradicate the film. Tests show a gallon of the fluid will coat 1200 square feet of surface.



FIRING an open hearth furnace from four points is a new method recently introduced to the steelmaking industry. Advantages of the method are held in abeyance.

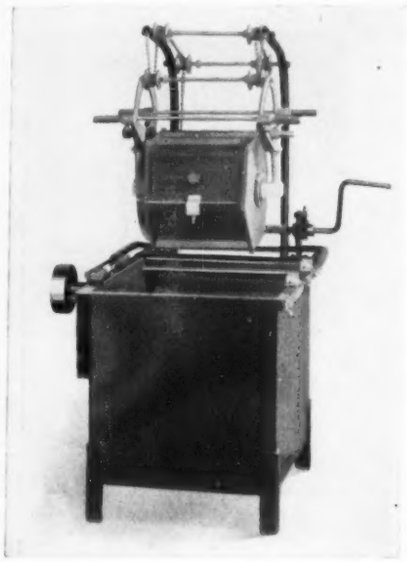
NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Small Plating Machine Is Sturdy in Construction

Udylite Process Co., 3939 Bellevue avenue, Detroit, recently developed a new model small plating machine suitable in size for plants that have frequent small rush jobs and for concerns with insufficient work for larger plating machines. The unit, shown herewith, is compact and sturdy. It eliminates suspension of auxiliary barrels on the still tank cathode rod, which procedure disturbs production.

The tank is of welded heavy steel



Small plating machine manufactured by Udylite Process Co.

construction. A hand hoist and drain board for raising the cylinder and conveniently emptying the load without loss of solution are provided. Either belt or direct electric motor drive is furnished, the latter providing the advantage of placing the machine in any position regardless of belting and shafting.

◆

Develops Die Head for Pipe Threading Machines

Oster-Williams Co., 2057 East Sixty-first street, Cleveland, recently brought out a new die head which can be installed on old pipe machines. Range of the new unit covers all sizes of pipe from 1 to 6 inches and bolts from ¾ to 6 inches inclusive. Threading dies are of high-speed steel, five to a set, and are of the small segmental type, mounted in holders. Single segments are replaceable. For pipe work one set of dies threads all sizes from 1 to 2 inches and another set from 2½ to 6 inches, thereby eliminating frequent die changes. The head is equipped with single high-speed cutting blade mounted on a gibbed slide, screw operated. Pipe is supported by a three-jaw, universal centering guide when being cut off.

◆

Double-Crank Horn Press Side Seams Metal Drums

Niagara Machine & Tool Works, Buffalo, recently added to its line a double-crank horn press for side seaming metal drums. The unit is equipped with a duplex side seaming horn for making hooks and closing the side seam of drum bodies. Adjacent edges of body cylinders are folded, one up and one down, in the first stroke of the press slide. In a second stroke, the previously assembled hooked edges, are bumped together. The closing or bumping tool is made with provisions for offsetting the seam either inside or outside. The horn, a steel forging, supported at both ends permits side seaming relatively small diameters.

◆

Breaker and Disconnecting Switch Combined

General Electric Co., Schenectady, N. Y., recently announced a combination oil circuit breaker and group-operated disconnecting switch enclosed in a submersible housing, for mounting on the walls of underground vaults. Both the circuit breaker and the disconnecting switch have manual operating levers which are so interlocked that the switch cannot be operated when the breaker is closed, nor can the breaker be closed when the switch is open.

Both levers are on the outside of the case, with the operating shaft passing through watertight packing glands. The tank for the breaker unit has a sealing flange and a watertight gasket. The breakers are not limited to manual operation, but can be obtained equipped for operation electrically. Ratings run up to and including 15,000 volts, 2000 amperes.

Cups of New Goggle Made of Transparent Material

Wilson Products Inc., Reading, Pa., recently introduced a new transparent cup goggle. Light passes through the walls of the cup undimmed and permits an entirely normal eye condition, the blinder being eliminated. The goggle is sturdy, has strength to withstand impact, is spark proof and extremely light in weight. It serves well for general all-purpose use and can be worn over spectacles.

◆

Motor, Speed Reducer Built On Pyramidal Base

U. S. Electrical Mfg. Co., 200 East Slauson avenue, Los Angeles, recently introduced a new Synchrogear motor in which both motor and gears are supported on the same pyramidal, rigid gear-pedestal base, centrically located, toward which load and all high torsional stresses converge. This self-contained design of a motor and speed reducer, shown herewith, minimizes cantilever

Combined motor, speed reducer built by U. S. Electrical Mfg. Co.

stresses from overhanging gears by a short train structure.

The design is unusual in that the high speed gears are not permitted to be submerged in the reservoir of oil, thus reducing resistance, heat and foaming caused by high speed churning of the lubricant. Forged helical gears and pinions are used which are high in nickel, carbon and molybdenum, heat treated, hardened and ground. Fully enclosed gear compartment excludes foreign matter. Labyrinth seals within shaft apertures prevent oil leakage from the enclosed gear case.

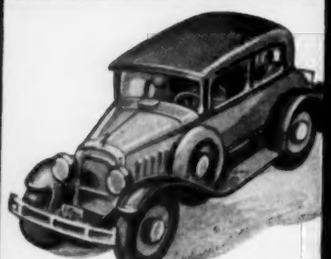
American QUALITY Steel & Wire Company

SPRINGS

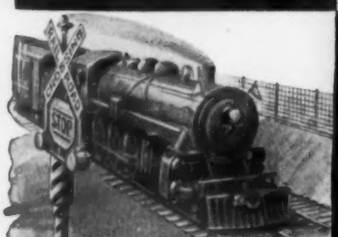
WHEREVER you see a good product in which springs provide motive force or tension—the chances are that the springs in question were made by the American Steel & Wire Company. The reason for this is simple. A majority of manufacturers specify them because of proved quality—unfailing performance and our ability to exactly meet specific applications. Concerning your own spring problem—we will gladly cooperate in providing a new standard of dependability—a new measure for economy. Write us today.

FOR EVERY TENSION OR MOTIVE FORCE REQUIREMENT

AUTOMOBILES TRUCKS



CLOCKS AND DELICATE INSTRUMENTS OF ALL KINDS

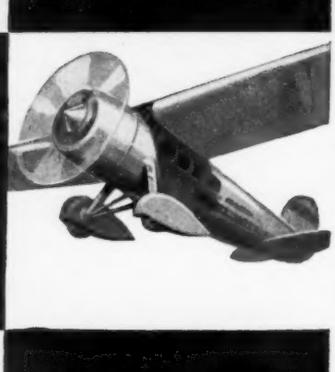


TRAINS SIGNALS SWITCHES

HOUSEHOLD UTILITIES

TOYS AND NOVELTIES

AIRPLANES



OFFICE APPLIANCES

and-

COUNTLESS OTHER USES

1831 — MORE THAN 100 YEARS OF PROGRESS IN WIRE MAKING — 1933

AMERICAN STEEL & WIRE COMPANY

208 South La Salle Street, Chicago
94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
AND ALL PRINCIPAL CITIES

Empire State Bldg., New York
First National Bank Bldg., Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

Ingot Rate 33 Per Cent, on Heavier Covering

Runaway Markets Developing in Scrap and Light Finished Steel—Scrap Prices Continue To Mount—Steel Users Anxious To Build Stocks

IRON and steel markets attained almost runaway proportions last week when the steelworks operating rate jumped 4 points to 33 per cent, highest of any week since Aug. 18, 1931; scrap prices lifted as much as $1.50 a ton, on top of previous large advances, and some automobile manufacturers covered their finished steel requirements into the third quarter.

Continued buying of an extensive, general character, mainly for immediate consumption, raised the operating rate in the Wheeling, W. Va., district 11 points to 61 per cent; in Greater Cleveland, 7 points to 48 per cent; Youngstown, 3 points to 33; Buffalo, 3 to 38; Pittsburgh, 1 to 22; Philadelphia ½-point to 15½ per cent.

Further gain in steel ingot production is indicated for this week, especially at Youngstown, and the rate may go to 41. In the meantime, the anxiety of most consumers to cover ahead has become even more pronounced.

Pig iron production in April, at a daily rate of 20,770 gross tons, represented a lift of 18.8 per cent over March. An increase of 10 in active stacks, making 48 out of 291 in blast at the close of April, presages further improvement in May. Total output for April, 623,097 tons, was up 14.9 per cent from March.

May production of automobiles, probably 200,000 units, will register a gain of approximately 25,000 over April and represent a 60 per cent rate of activity for the industry, considering 1924-9 as average. June is forecast to be as good as May.

Although the market for structural steel has been lagging, due to delay in government projects, awards for the San Francisco-Oakland bridge—144,128 tons, including cable—have now carried the cumulative tonnage so far this year to more than 15 per cent above that in 1932. Fabrication will engage Illinois and Pennsylvania mills, though actual production on a large portion may not start for some months. The R.F.C.'s approval of a $5,000,000 loan for a Hudson river bridge assures another 15,000-ton steel job. Pennsylvania railroad will distribute 20,000 to 25,000 tons of rails.

Coincident with a rise in tin plate production to 55-60 per cent, and an increase of 15 per cent in the price of pig tin, there is speculation of a contemplated advance in tin plate for second half, a midyear adjustment being unusual. Improved demand for heavy finished steel also leads to a general expectation of a price advance shortly.

Steelmakers display growing concern over the scarcity and mounting prices of scrap; practically all are seeking additional stocks. In the Chicago district, heavy melting steel scrap has advanced $3.50 since March, now selling at $9 per ton; and recent sales of this grade are noted at Pittsburgh above $12.

Pig iron shipments to the automotive industry by lake furnaces, it appears now, are only 35 per cent of their total, reflecting broader consumption, especially of steelmaking grades. The markets exhibit a rising tendency, and in eastern Pennsylvania foundry grades have been definitely advanced $1 a ton. American Radiator & Standard Sanitary Corp. has made a purchase of coke, reported as high as 100,000 tons.

Lake Superior iron ore shipments in April were up nearly 89 per cent over last April, and the United States Steel Corp. has just started out 15 of its vessels, in contrast with nine, last July. Domestic fluorspar is up $1 a ton.

STEEL's iron and steel composite this week is up 9 cents to $28.29; the finished steel composite is unchanged at $45.10; and the scrap composite is raised 75 cents to $9.

Composite Market Averages

	May 6	April 29	One Month Ago April, 1933	Three Months Ago Feb., 1933	One Year Ago May, 1932	Ten Years Ago May, 1923
Iron and Steel Composite	$28.29	$28.20	$28.16	$28.31	$29.62	$47.52
Finished Steel Composite	45.10	45.10	44.94	45.35	47.62	68.43
Steelworks Scrap Composite	9.00	8.25	7.23	6.33	7.03	22.95

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	May 6, 1933	April 1933	Feb. 1933	Mar. 1932
Pig Iron				
Bessemer, del. Pittsburgh	$16.26	16.26	15.76	16.13
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	15.19	14.19	13.50	15.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	16.16
No. 2 foundry, Chicago	15.50	15.50	15.50	15.60
6Southern No. 2, Birmingham	12.00	11.40	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	15.76	14.51	13.76	14.76
Malleable, valley	14.50	14.50	14.50	15.00
Malleable, Chicago	15.50	15.50	15.50	15.60
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	15.63	15.63	15.63	15.63
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	80.24

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.75	2.15
Connellsville, foundry, ovens	2.25	2.25	2.50	3.15
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	May 6, 1933	April 1933	Feb. 1933	Mar. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.65	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.50	1.55	1.60	1.60
Tank plates, Philadelphia	1.54½	1.49½	1.59½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.55	1.55	1.60	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.00	2.00	2.20
Sheets, No. 24 galvan., Pitts.	2.70	2.65	2.50	2.85
Sheets, No. 10 blue anneal., Chi.	1.70	1.70	1.85	1.85
Sheets, No. 24 hot ann., Chicago	2.15	2.15	2.15	2.35
Sheets, No. 24 galvan., Chicago	2.85	2.80	2.75	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	1.85	1.85	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$12.25	9.90	8.35	9.75
Heavy melting steel, eastern Pa.	8.25	6.90	6.50	6.44
Heavy melting steel, Chicago	8.75	6.55	5.25	6.20
No. 1 wrought, eastern Pa.	10.25	7.35	6.50	7.75
No. 1 wrought, Chicago	8.10	5.25	5.00	5.25
Rails for rolling, Chicago	10.25	8.25	7.75	8.25

Sheets

Market Continues Active—Automobile Builders Cover Ahead —Prices Firmly Established

SHEET PRICES, Page 43

Pittsburgh—Bookings of practically all grades of sheets last week were at the highest pace in over a year, caused in part by advances in hot and cold-rolled sheet schedule of $2 to $3 a ton and speculation that further advances may be attempted. Buying is well diversified. So many sheet buyers were covered by contracts that there has been little test of the new prices, but announcement of the advance has had the effect of making minimums on present quoted levels firmly established.

Cleveland—With automotive and miscellaneous sheet requirements increasing, mills are more cautious in quoting for forward delivery, and endeavoring to discourage speculative buying, or carryovers for third quarter. Most producers are making it a condition of new contracts that all material for second quarter be specified by June 30, mills having to July 15 to ship. Mills say they will refuse to permit consumers to stock up for third quarter, even if the buyer should specify before June 30. Mill operations here and in an adjacent lake area are up to 60 to 75 per cent, nearly 90 per cent of output going to auto builders and partsmakers. Refrigerator demands continue to improve; the sales season for refrigerators was late in getting started, but gives indications of being prolonged, as manufacturers' schedules are being revised upward.

Chicago—Sheet orders and shipments are holding well, with production continuing 35 to 40 per cent. While a slight decrease has been noted in automotive specifications, demand from this industry is expected to hold around recent levels for several weeks, with seasonal decreases thereafter. Broadening in demand from miscellaneous consumers is noted in some directions. Larger users are under contract for a brief period ahead at old prices, and present quotations $2 a ton over contract levels have yet to be tested.

St. Louis—Sentiment in sheets has improved to more than sales. Continued betterment in actual volume placed, however, is noted. Miscellaneous demands still dominate. Railroads and the automotive industry have not yet materially increased their takings. Container manufacturers have been purchasing more freely, and seasonal demands for galvanized material are appearing. Prices are firm, with the trend upward. The leading local producer is quoting 1.84c, delivered in St. Louis, on hot-rolled No. 10; 3.04c on galvanized; and 2.44c on hot-rolled annealed No. 24.

Philadelphia — Autobody buying and good barrel releases dominate sheets. This business continues to demand concessions under the general market, which otherwise is firm at the new prices. Republic Steel Corp. is low on 140 tons of license tag stock for North Carolina at a reported price of 2.80c, Pittsburgh.

New York—Sheet releases are in an unchanged volume from a week ago. Recent advances are applying on new business, but most consumers are protected by former prices for the quarter.

Cincinnati — Production schedules of district sheet mills were increased to meet improvement in demand which has become more diversified. Recent price advances have inspired buyer's attempts to cover future needs, but mills are believed to be refusing coverage beyond second quarter.

Birmingham, Ala. — Production is slightly better in sheets, with mills being kept in good shape. Agricultural sections offer brighter prospects on sheets and wire.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10 (24 to 48 inches wide)

Pittsburgh, base	1.40c to 1.50c
Chi. dist. mills	1.50c
Chicago, del.	1.55c
New York, del.	1.75c
Birm., base	1.55c
Philadelphia, del.	1.71c
*St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.55c to 1.65c
Chi. dist mills	1.65c to 1.75c
Chicago, del.	1.70c to 1.80c
*Phila., del.	1.96c
*New York, del.	2.00c
St. Louis, del.	1.89c to 1.99c
Birm., base	1.70c to 1.80c
San Fran., c.i.f.	2.32½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.00c to 2.10c
Chi. dist. mills	2.10c to 2.20c
Chicago, del.	2.15c to 2.25c
*New York, del.	2.45c
*Phila., del.	2.31c to 2.41c
Birm., base	2.15c to 2.25c
*St. Louis, del	2.44c
San Fran., c.i.f.	2.85c

GALVANIZED No. 24

Pittsburgh, base	2.60c to 2.70c
Chi. dist. mills	2.80c
Chicago, del.	2.85c
Philadelphia, del.	3.01c
New York, del.	3.05c
Birm., base	2.75c to 2.85c
*St. Louis, del.	3.04c
*San Fran., c.i.f.	3.35c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, del.	2.64c

HEAVY COLD ROLLED No. 10

Pittsburgh, base	1.90c to 2.05c
Chi. dist. mills	2.00c to 2.15c
Chicago, del.	2.05c to 2.20c
*Philadelphia, del.	2.36c
*New York, del.	2.40c

COLD ROLLED No. 20

Pittsburgh, base	2.30c to 2.45c
Do, autob. qual.	2.55c to 2.70c
Do, furn. qual	2.90c to 3.05c
Chi. dist. mills	2.40c to 2.55c
Chicago, del.	2.45c to 2.55c
Philadelphia, del.	2.61c to 2.76c
*New York, del.	2.80c

ENAMELING SHEETS

Pitts., No. 10	2.40c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.75c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.50c to 1.60c
New York, del.	1.60c to 1.70c
Phila., del.	1.49½ to 1.59½
Boston, del.	1.72c to 1.82c
Buffalo, del.	1.85½c
Chicago, base	1.70c
*Cleveland, del.	1.80½c
Birmingham, base	1.75c
Coatesville, base	1.40c to 1.50c
*Pacific Coast, c.i.f.	1.75c
St. Louis, del.	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.65c to 1.75c
New York, del.	1.77c to 1.87c
Boston, del.	1.90½c to 2.00½c
Chicago, base	1.70c
*Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
Boston, del.	2.02c
Pitts., cold finish	1.70c
Pitts., forg. qual.	1.75c and 1.85c
San Fran., c.i.f.	2.10c

RAIL STEEL

Pitts., Buff., St. Louis	1.30c
Chicago, base	1.50c
Eastern mills	1.30c

IRON

Chicago, base	1.60c to 1.65c
New York, del.	1.85c to 1.90c
Philadelphia, del.	1.81c to 1.86c
Pitts., refined	2.70c to 4.20c

REINFORCING

New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.55c
Chicago, rail steel	1.30c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher with 10% discount off extras; joint carloads 10 cents higher with no discount from extras; pool carloads 20 cents up; less carloads 30 cents up.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.85
Cement coated nails	1.85
Galvanized nails	3.35

(Per pound)

Polished staples	2.55c
Galvanized fence staples	2.80c
Barbed wire, gal.	2.35c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$50.00

(To Manufacturing Trade)

Plain wire, 6-9 ga.	2.10c
Spring wire	3.10c

Anderson, Ind., $1 over Pitts.-Cleve.; Chicago, Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.70c
20,000 to 59,999 lbs.	1.65c
6,000 to 99,999 lbs.	1.60c
100,000 lbs. and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

Cumberland, Md., base

1⅛-inch	3.00c
1⅛ to 1½-inch	2.50c
1⅝ to 1⅞-inch	2.20c
2⅛ to 6-inch	2.05c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			0.20
6100 bars			1.20
6100 spring			0.95
Cr., Ni., Van.			1.50
Carbon van.			0.95
9250 (flats)			0.25
9250 (rds., sq.)			0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.55c
Do., Chicago	1.65c
Do., del. Phila.	1.86c
Do., del. N. Y.	1.90c
*Cooperage hoop, Pittsburgh	1.65c
* Do., Chicago	1.65c to 1.75c
Cold-rolled strip, Pitts., Cleve.	1.80c to 2.00c
Worcester, 3 tons or over	2.10c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$20.00 to 22.00
50 to 75	$16.00 to 18.00
80 to 100	$20.00 to 21.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, R. R. mills	2.15c
Spikes, boat, b'ge, Pitts.	2.65c
Track bolts, Chi.	3.50c
Do., stand., job.	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chi.	$35.00

Rivets, Wrought Washers

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chi.	2.35c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 10 off
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chi. dist.	7.25 to 7.00 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	75 off
Rolled thread ½ x 6 and smaller	75 off
Eagle list	75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off

Tire bolts ..... 60 and 10 off

Stove bolts, 75, 25 and 10 off in pkgs.; 86 off in bulk, 5000 or more of a size.

Rolled thread machine bolts, ½ x 6 and smaller 75 off.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 85 off

Upset 1-in. diam., smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, c.l., Pitts.	$2.50
Do., less carloads, 5 kegs or over	$2.90

Steel piling, Pitts. 1.90c to 1.95c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

All discounts are net.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	60½	42
½	65½	54
¾	69	59
1—3	71	62

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	66	57
2½ to 6	69½	60½
7 and 8	68	58
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(*Please turn to next page*)

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

LINE PIPE

Steel

⅛-inch, butt weld	54
¼—⅜, butt weld	59½
½, butt weld	64½
¾, butt weld	68
1—3, butt weld	70
2-inch, lap weld	65
2½—6, lap weld	68½
7—8, lap weld	67
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, below. Charcoal Iron—Under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

Hot Rolled

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs. 40%
15,000 ft. or 22,500 lbs.....70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$32.00-33.00
4-in. Birm.	35.00-36.00
4-in. Chicago	43.40-44.40
6 to 24-in. Chicago	40.40-41.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B.
Stand. fitgs., Birm. base...$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Pig Iron

Per Gross Ton

FOUNDRY, No. 1

Chicago, furnace	$15.50
Pitts., dist. fur.	15.00
Pittsburgh, del.	15.63-16.13
Valley furnace	14.50
Cleve. fur., local del.	15.00
*Philadelphia del.	15.26
Virginia furnace	17.25
Granite City, Ill.	15.50
*St. Louis, del.	16.35
Buff., fur., local del.	16.00
Buff., all-rail, Bost.	19.05
Do, Brooklyn	18.90
Do, Newark	17.28
Ala., Birmingham	12.00
Ala., del. Chicago	16.01
Ala., del. St. Louis	15.85
Ala., del. Cincinnati	15.82
Ala., Phila., dock del.	17.00-17.25
Ala., Balt., dock del.	17.00
Ala., N. Y. dock	17.50
Ala., Bost. dock del.	17.50-17.75
Tenn., Bir. base	13.00
Tenn., del. Cinci.	15.82
Montreal, del.	23.00-23.50
Toronto, del.	22.10

FOUNDRY, No. 2X

Buff., fur., local del.	16.50
Buff., all-rail, Brook.	19.40
Do, Newark	17.78
Buff., all-rail, Bost.	19.55
Virginia furnace	17.75
*Eastern, del. Phila.	15.76

FOUNDRY, No. 1X

Buff. fur., loc. del.	17.50
*Eastern, del. Phila.	16.26

MALLEABLE

Valley furnace	14.50
Cleve. fur., loc. del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, del.	15.63-16.13
Chicago, furnace	15.50
Buff., fur., loc. del.	16.50
*Eastern Pa., del.	16.13-18.91
Granite City, fur.	16.00
Montreal, del.	24.00
Toronto, delivered	22.60

BASIC

Pitts., dist. fur.	14.50
Pittsburgh, del.	15.13-15.63
*Eastern Pa., del.	15.00-15.25
Buff. fur., loc. del.	15.50-16.00
Montreal, del.	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	15.00
Pittsburgh fur.	15.50
Pittsburgh, del.	16.13-16.63

LOW PHOS.

Valley fur. stand.	23.00-24.00
Phila., standard	22.76-25.79
*Copper bear., E. Pa. furnace	22.00-23.00

GRAY FORGE

Valley furnace	14.50
Pitts. dist. fur.	15.00
Pittsburgh, del.	15.63-16.13

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

Jackson County, O., fur. 7%—$18.50; 8—$19; 9—$19.50; 10—$20; 11—$21; 12—$22; 13—$23; 14—$24; 15—$25; 16—$26; 17—$27.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., 10%—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.80
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
No. Afr. low phos.	7.00
Swedish basic, 65%	7.50- 8.00
Swedish low phos.	8.00
Spanish, No. Afr. basic, 50 to 60%	7.00
Tungsten, spot, sh. ton unit, duty pd.	$9.65- 9.90
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$15.50-16.50

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	nominal
So. African, 52%....	18 to 19 cts.
So. Afr., 49-51%....	nominal
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Ala.	$35.00
Missouri	35.00

Second Quality

Pa., O., Ill., Ky., Md.	30.00
Missouri	30.00
Georgia, Alabama	30.00

MALLEABLE BUNG BRICK

All bases	40.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, E. Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$61.50
Unburned	52.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$42.50

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	38.00
Domes, Chewelah, Wash., base	20.90

Fluorspar

85 to 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$11.50
Washed gravel, import duty paid tide, gross ton	$17.50

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.50c-1.60c

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$1.75
Connellsville fdry.	2.25- 2.50
Connell. prem. fdry.	4.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, ovens Connell. basis	4.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	$68.00
del. Pitts.	73.24
Spiegeleisen, 19-20%, dom. fur., spot†	24.00
Ferrosilicon, 50%, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	0.94- 1.00
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton c. l., 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

Bars

Consumers Broaden Orders—Automotive Users Take Most—General Needs Asserted

BAR PRICES, PAGE 43

Pittsburgh — Higher bar mill operations reflect the prevailing stronger demand. Schedules were stronger the past week in three leading bar mills in this district. Automotive specifications for both carbon and alloy bars make up much of the present improvement. Although there is no change in 1.60c base, Pittsburgh, on carbon bars, an advance is considered likely.

Cleveland—Orders for commercial steel bars are more numerous and from a larger variety of consumers, though automotive requirements continue to lead in volume. Forging shops here are more active than at any other time this year. Some mills note a particularly good demand for truck rim sections. Buying by agricultural implement manufacturers has improved slightly. Bars are firm at 1.65c, base, Cleveland.

Chicago—Steel bar demand continues to show moderate gains. More miscellaneous consumers are increasing requirements, while automotive buying is well sustained and continues to account for a large share. Buying still is limited principally to prompt requirements and although some material is moving to stock, occasioned more by the increase in operations among consumers than by fears of price inflation. The market is steady at 1.70c, Chicago, and although higher prices are regarded as likely under the influence of general advances in commodities, no immediate revision in bar quotations is in prospect. Rail steel bars are steady at 1.50c, base.

Boston—Seven of the eight bidders on 107,000 pounds of hot-rolled one-inch round bar steel for the Boston navy yard bid 4.31c, delivered, the eighth bidding 6.31c. This is grade V steel for die-lock chain manufacture. Commercial steel bars are moving in small lots.

New York—Steel bar producers report better jobber releases but little change in requirements of manufacturers. Higher prices are being discussed with the possibility they may be effective on new business before the end of this quarter.

Philadelphia — Notwithstanding absence of railroad demand, steel bar specifications continue to expand, and while still far below normal, are the largest in several months. Jobbers have been specifying more actively and there is a better miscellaneous demand for manufacturing purposes. Prices are unchanged at 1.60c, Pittsburgh, or 1.91c, delivered, Philadelphia, the level at which they have been holding for many months. Common iron bars are moving in restricted but slightly better volume at $1.50c, Pittsburgh, or 1.81c, Philadelphia.

Higher Tin Plate Price in Last Half Seen Possible

Tin Plate Prices, Page 43

New York—The advancing market in pig tin and other raw materials combined with increasing strength of the iron and steel markets generally, has forced a speculation as to prospects for an increase in tin plate prices for the second half. Seldom have changes been made in the middle of the year, but the general inflationary tendency in commodities has resulted in more than ordinary conjecture as to the second half.

Consumption of tin plate this year is expected to be under normal, but larger than last year. At the moment, tin plate buying is one of the high spots of the iron and steel markets. The average for the industry is more than 55 per cent, with some mills now at capacity. This movement, of course, is seasonal, and would not be sufficient to justify any advance in second half prices.

The upturn in commodity prices have injected a factor for advance, that has not come up for more than three years. Since Jan. 1 tin prices have advanced about 10 cents, from about 22½ for spot Straits to almost 33 cents. With 1½ pounds of tin to each box for tin plate, according to conservative estimates, the added cost of each box has been over 15 cents. Incidentally, tin in the past fortnight has risen 7 cents.

Pittsburgh—Tin plate buyers are anticipating a little further ahead and thereby allowing producers more flexibility in gaging their operations. Due to more volume in canmakers' specifications, average rate of tin mill operations is 55 to 60 per cent, with the possibility that by the end of this week 60 may be the average. Wheeling Steel Corp.'s Yorkville, O., plant began operating 100 per cent with 24 mills on, beginning May 1.

Plates

Tanks for Oil and Beer Aid Market with General Buying at Better Rate

PLATE PRICES, PAGE 43

Pittsburgh—Absence of railroad buying is still keenly felt in the plate market and though river barge work is promising, orders are slow to be closed. Plain material is unsettled and is quoted at 1.50c to 1.60c base, Pittsburgh, with little tonnage to provide test. McClintic-Marshall Corp.'s bid of $16,025 is low on a 93 x 37 x 7-foot steel scow to take approximately 100 tons of plates for the tenth United States lighthouse district, Buffalo.

Cleveland—Plates are not sharing proportionately with other finished steel products in the general rise in orders and shipments. Most current inquiries are for brewery tanks; comparatively few are being placed, and the tonnage is light. Small boilers shops appear more active than the larger. Railroads continue to buy sparingly for repair purposes.

Chicago—Tank orders are slightly heavier, recent awards of larger lots involving about 1000 tons, principally for oil companies. Some business continues to be received from breweries, one local interest having placed orders for tanks involving 250 tons. Miscellaneous inquiry is more active and better business is looked for in oil storage tanks soon. Plate requirements of railroads are light, while little business in line pipe is pending.

Boston—Plate fabricators are ordering in small lots, but such orders are fairly numerous. On small orders prices are 1.40c to 1.50c, Coatesville, Pa., but carloads have been sold under 1.40c.

New York — Between 2500 and 3000 tons of plates and shapes have been placed by the Pan-American Oil Co. for a refinery at Houston, Tex., with releases on a Baltimore project to follow. Standard Oil Co. of New Jersey may inquire soon for a gas absorption plant for Baton Rouge, La. Recent brewery tonnage includes 400 tons for one project. Plate prices

are unchanged. Foster-Wheeler Corp. is low on two boilers for the Coast Guard cutter PEQUOT at $8000 each, bids April 28.

Philadelphia—Miscellaneous buying of plates is better, but with one or two exceptions there is no large tonnage. Action on the 3500 tons of gas holder work for the Philadelphia Gas Co. is expected about the middle of this month. Railroad buying is negligible. Prices are firmer at 1.49½c to 1.59½c, delivered, Philadelphia, with the possibility of higher quotations by the end of this month on new business.

Contracts Placed

500 tons, oil storage tanks, Barnsdall Corp., to Graver Tank & Mfg. Corp., East Chicago, Ind.

270 tons, tanks on wood barges, Molasses Products Co., to Maxweld Corp., Brooklyn, N. Y.

250 tons, tanks, Best Malt Products Co., Chicago, to Graver Tank & Mfg. Corp., East Chicago, Ind.

220 tons, tanks, Pure Oil Co., Chicago, to Chicago Bridge & Iron Works, Chicago.

475 tons, brewery tanks, Piel Bros., Brooklyn, to Dover Boiler Works, Dover, N. J.

200 tons tanks, Metropolitan brewery, New York, to Dover Boiler Works, Dover, N. J.

Contracts Pending

1133 tons, armor plate, bureau of ordnance, navy, Washington; bids May 23.

250 tons, plates and shapes, mainly former, Panama; Central Iron & Steel Co., Harrisburg, Pa., low on plates, $6207.14, delivered; United States Steel Products Co., low on shapes. Bids April 28, schedule 2858.

250 tons, 32-inch welded steel pipe, Pittsburg, Calif.; projected.

225 tons, 200,000-gallon tank and tower, Torrance, Calif.; projected.

200 tons, two derrick boats; bids May 17 by United States engineer, St. Louis.

200 tons, oil tanks, Chelsea, Mass.

100 tons or more, tanks, brewery, Cambridge, Mass.

100 tons, approximately, one steel flat deck scow, 93 x 37 x 7 feet, for tenth United States lighthouse district, Buffalo; McClintic-Marshall Corp., Bethlehem, Pa., low at $16,025; Jones & Laughlin Steel Corp., Pittsburgh, second low at $16,970; and Treadwell Construction Co., Midland, Pa., third at $17,800.

Railroads

Pennsylvania Promises Rail Distribution Shortly

Track Material Prices, Page 43

Announcement by the Pennsylvania railroad that it will distribute orders for 20,000 to 25,000 tons of steel rails shortly give rail mills a brighter outlook. The navy will take bids May 23 on 100 tons of light rails and five tons of splice bars.

Chicago mills are rolling rails on a low schedule and have no additional tonnage in sight. Fastenings are more active there, but releases are light. Edgar Thomson mill of the Carnegie Steel Co., which started rolling rails April 19, completed its schedule May 2 and is closed again.

Koppel Industrial Car & Equipment Co., Koppel, Pa., has booked superstructures for 200 box cars for export to China. National Poultry Car Co., Chicago, is inquiring for 100 poultry cars. New York Central has returned 1650 men to work in its West Albany, N. Y., shops.

Purchases of railroad cars in April numbered 50, with a total of 58 for four months. Comparisons follow:

	1933	1932	1931	1930
Jan.	3	159	100	5,072
Feb.	0	35	50	17,027
March	5	105	2,166	6,118
April	50	0	2,798	1,997
4 mo.	58	299	5,114	30,214
May		60	20	1,392
June		0	1,910	998
July		25	617	1,389
Aug.		5	1,304	1,111
Sept.		1,298	703	576
Oct.		0	980	4,116
Nov.		2	35	2,621
Dec.		50	11	2,729
Total		1,739	10,694	45,146

Inquiry by the Missouri Pacific for 9000 tons of tie plates, reported last week as placed, has been definitely dropped for the present.

Wire

Better Output; Prices Firm Heavier Specifications Give

Wire Prices, Page 43

Pittsburgh — Wire mill activity holds its recent improvement, a direct reflection of current buying. The present price of $1.85 on nails and 2.10c for plain manufacturing wire, both being for buyers who did not contract several months ago when lower prices were in effect, is quoted unchanged for this quarter.

Cleveland—The number of orders for wire and nails improves steadily. Demand for wire from manufacturers is more widespread, and recently jobbers throughout northern Ohio have been purchasing larger amounts of wire and nails. Numerous efforts are being made to cover at present prices for the remainder of the year, but mills refuse to ge beyond June.

Chicago—Wire demand continues to improve steadily and the outlook is regarded as the most favorable in more than a year. While recent betterment is accounted for principally by increased activity in manufacturers' wire, a small upturn is noted in buying in agricultural districts.

Worcester, Mass. — Demand for wire holds the recent increase, some specialties showing gains. Price are firm with plain wire 2.20c, Worcester. Simplex Wire & Cable Co., Boston, is low on recent coast guard requirements for submarine telephone cable.

Strip

Increasing Needs Reflected In Heavier Buying

Strip Prices, Page 43

Pittsburgh—Because it is difficult so far to establish any minimum in the cold strip market, the proposed advance of $3 a ton has not been put into effect. Cold strip ranges from 1.80c to occasionally 2.00c and less than 1.80c has been frequently done in Detroit. Sales were made last week on hot-rolled strip at 1.55c, Pittsburgh, this representing a test of the recent $2 advance.

Cleveland—Specifications for hot-rolled and cold-rolled strip indicate shipments this month will exceed those of April. While all mills now are on a basis of 1.55c, Pittsburgh, for hot-rolled strip, cold-rolled strip continues 1.80c to 2.00c, base Cleveland.

Chicago—Strip specifications and shipments are active and business is equal to or better than that of the preceding several weeks. While automotive business leads, additional orders are being received from other sources. A Milwaukee brewery has placed 25,000 of such barrels and other substantial orders have been placed by other interests. A. O. Smith Corp., Milwaukee, is producing 1000 steel barrels daily. Hot-rolled strip is steady at the new 1.65c, Chicago, price, with cold-rolled strip unchanged at 1.80c to 2.00c, Pittsburgh-Cleveland.

Boston—Recent improvement in demand for cold-rolled strip continues. While buying is generally in small lots, consumption is broader.

Philadelphia — An advance of $3 a ton on cold-rolled strip continues in immediate prospect, with a result that a fair amount of tonnage has been booked recently, more than in many weeks. Hot strip appears to be fairly established at 1.55c, Pittsburgh, or 1.86c, Philadelphia.

Financial News of Steel Industry

ALLEGHENY STEEL CO., Brackenridge, Pa., reports net loss of $131,937 after expenses, depreciation and including other income for the first quarter. This compares with net loss, on the same basis, of $366,378 for the first quarter of 1932.

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Ludlum Steel Co., Watervliet, N. Y., reports net loss of $107,683 in the first quarter of 1933, after charges, compared with loss of $50,409 in the same period of 1932.

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Follansbee Bros. Co. Inc., Pittsburgh, reports in its net loss of $205,684 for the March quarter, a considerably better showing than the net loss of $301,196 for the same quarter of 1932.

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A. M. Byers Co., Pittsburgh, reports net deficit of $326,214 for the first quarter, compared with net deficit of $285,043 in the previous quarter.

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American Rolling Mill Co., Middletown, O., reports net loss of $966,594 in the first quarter, after charges, against $571,917 a year ago.

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Granite City Steel Co., Granite City, Ill., encountered net loss of $80,325 after charges in the first quarter; its loss a year ago was $37,896.

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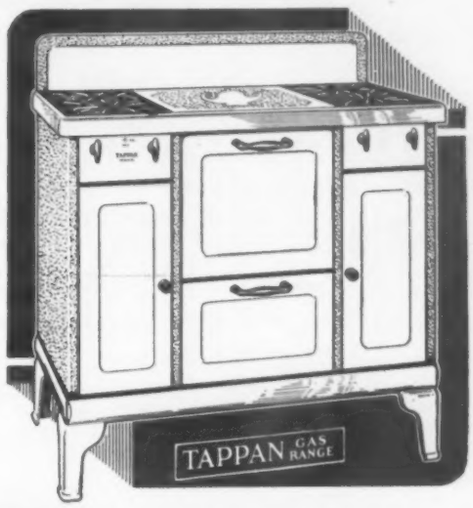
Superior Steel Corp., Pittsburgh, had net loss of $172,337 in the first quarter, compared with loss of $150,664 in the opening quarter a year ago.

Sheet and Tin Plate Mill Wages Unchanged

Wage rates in sheet and tin plate mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be unchanged for May and June, the average sales price of Nos. 26, 27 and 28 gage black sheets holding at 2.30c per pound in March and April. Monthly comparisons follow:

Jan.-Feb.	2.30c	2.40c	2.60c
March-April	2.30c	2.30c	2.65c
May-June		2.30c	2.50c
July-Aug.		2.30c	2.40c
Sept.-Oct.		2.30c	2.40c
Nov.-Dec.		2.30c	2.40c
Yearly average		2.31c	2.49c



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Structural Shapes

Largest Award Ever Made On Pacific Coast Requires 122,265 Tons of Shapes—To Be Fabricated in Gary, and Ambridge, Pa.—General Market Is Quiet

STRUCTURAL SHAPE PRICES, PAGE 43

San Francisco—Three contracts have been awarded to the Columbia Steel Co., United States Steel Corp. subsidiary, for 144,128 tons of structural shapes, reinforcing steel and cable for the San Francisco-Oakland bridge, the largest contract of this kind ever placed on the Pacific coast.

Steel items in contract No. 6 for the West Bay superstructure, calling for a total of 65,060 tons, follow: 2400 tons of silicon steel and 14,500 tons of carbon steel in the suspended portion; 18,500 tons of silicon steel, and 5000 tons of carbon steel in towers; 1100 tons reinforcing bars; 730 tons cast steel; 300 tons rivets; 350 tons heat-treated eye-bars; 255 tons carbon steel eye-bars; 280 tons nickel steel, and 25 tons phosphor bronze steel.

Contract No. 7 for the East Bay superstructure calls for 59,463 tons of steel, as follows: 28,075 tons of silicon steel; 22,650 tons carbon steel; 4250 tons of heat-treated eye-bars; 3400 tons nickel steel, and 1058 tons reinforcing bars.

Contract for cable requires 18,700 tons of cable and 905 tons of attachments and bolts.

Pittsburgh—The American Bridge Co. in its Gary, Ind., and Ambridge, Pa., shops will fabricate most of the structural steel for the San Francisco-Oakland bridge. The fabrication of this steel may be as far away as two years, with prospects that only the towers will be constructed this year. Structural inquiry is running low. Plain material still is based on 1.60c, Pittsburgh, and large tonnage concessions are limited to $2 a ton.

Cleveland—Small fabricators are more active, but large structural tonnages are lacking. The state is understood to be preparing to revive bridge and road projects on which bids were taken in March, and which were suspended because of the bank holiday. This would release 400 to 500 tons of shapes. Plain material is 1.60c, base, Pittsburgh, for the usual small orders.

Chicago—Structural inquiries recently have declined sharply to the lowest level in recent years. This results principally from the almost complete absence of public work. Private construction involves insignificant tonnages. A portion of the tonnage for the San Francisco-Oakland bridge recently awarded will be rolled and fabricated here.

Boston—Small miscellaneous demand for brewery work is slightly heavier. Fabricating shops in New England have stocks down to a minimum, some having practically no plain material on hand.

New York—Approval of a $5,000,000 loan has been voted by the R.F.C. for a Hudson river bridge, Green-Columbia counties, New York, which will require approximately 15,000 tons of steel, mainly shapes. Except a 900-ton award to a Buffalo fabricator for a state prison buildings structural business is light.

Philadelphia—Bids will be opened May 26 on the proposed piers of the Pennsylvania railroad in Baltimore, involving 5000 tons of shapes, 600 tons of reinforcing bars and possibly 300 tons of sheet piling. These bids are primarily for estimating purposes, with ultimate action depending largely on the railroad program adopted by the government.

Contracts Placed

122,265 tons, shapes and miscellaneous steel except reinforcing bars, contracts Nos. 6 and 7, San Francisco-Oakland bridge, to Columbia Steel Co., San Francisco.

800 tons, shapes and plates, refinery, Marathon Oil Co., Fort Worth, Tex., to M. W. Kellogg Co., New York.

750 tons, sheet piling and structural steel for bulkhead and breakwater, on Illinois river, Peoria, Ill., to Carnegie Steel Co., Pittsburgh; through Union Bridge & Construction Co., Kansas City, Mo. Project sponsored by federal engineers, Chicago district.

Shape Awards Compared

	Tons
Week ended May 6	126,175
Week ended April 29	7,405
Week ended April 22	14,483
This week in 1932	11,551
Average weekly, 1932	14,285
Average weekly, 1933	16,143
Average weekly, April	8,912
Total to date, 1932	264,176
Total to date, 1933	306,734

900 tons, prison buildings, Dannemora, N. Y., to Lackawanna Steel Construction Corp., Buffalo; Lowman Construction Co., Elmira, N. Y., general contractor.

360 tons, column guards and miscellaneous building steel, New York Central railroad terminal, New York, to Sexauer & Lemke, Brooklyn, N. Y.

240 tons, three 115-foot spans, Randolph City, Ill., to Vincennes Steel Corp., Vincennes, Ind.

230 tons, hangar, Fort Worth, Tex., to Fort Worth Structural Steel Co. and North Texas Iron & Steel Co., Fort Worth.

150 tones, bridge, Ulster county, New York, to Lackawanna Steel Construction Corp., Buffalo; through Morrell, Vrooman Co.

150 tons, Niagara Falls auditorium, World's fair, to Duffin Iron Works, Chicago.

130 tons, 180-foot truss span, Champaign City, Ill., to Duffin Iron Co., Chicago.

100 tons, substations, metropolitan water district, Los Angeles, to unnamed interests.

100 tons, bridge, Newton, Mass., to Lackawanna Steel Construction Corp., Buffalo.

Contracts Pending

15,000 tons, Rip Van Winkle bridge across Hudson river in Green-Columbia counties, New York; bids June 1. R. F. C. approves loan for $5,000,000.

5000 tons, piers, Pennsylvania railroad, Baltimore; bids to be opened May 26; 600 tons of reinforcing bars and 300 or 400 tons of piling may be required.

2050 tons, jail and cells, San Francisco; bids rejected, and new bids May 5.

1500 tons, highways, Missouri highway commission, Jefferson City, Mo.; bids May 5.

1500 tons, contract No. 5, Yerba Buena island crossing, San Francisco-Oakland bridge, San Francisco. General contract to Clinton Construction Co., San Francisco at $1,821,292.

1350 tons, contract No. 3, San Francisco anchorage, San Francisco-Oakland bridge, San Francisco. General contract to Healy-Tibbitts Construction Co., San Francisco, at $1,036,500.

1285 tons, Glendale, boulevard viaduct, Los Angeles; bids soon.

600 tons, building, 200 x 600 feet, Moline, Ill., for International Harvester Co., Chicago.

500 tons, St. Joseph's hospital, Yonkers, N. Y.

350 tons, spillway gates, Pine Canyon dam, Pasadena, Calif.; bids in July.

330 tons, monastary building, Villanova, Pa.; Harry E. Baton, Philadelphia, awarded general contract.

250 tons, Norton hall, University of Buffalo, Buffalo.

248 tons, contract No. 4 and 4-A East bay substructure, San Francisco-Oakland bridge, San Francisco. General contract to Bridge Builders Inc., San Francisco at $4,495,854.

150 tons, building for Catholic Union

& Times, Buffalo; bids about June 15.

150 tons, and 225 tons of timber fastenings, contract No. 2, West bay substructure, San Francisco-Oakland bridge, San Francisco. General contract to Transbay Construction Co., San Francisco, at $6,957,100.

Bolt, Nut Buying Slow; Automotive Orders Lead

Bolt, Nut, Rivet Prices, Page 43

Automotive buying of bolts and nuts has given Cleveland makers an increase of 40 per cent in April over March. There also was fair buying by railroads and jobbers in that district. At Chicago absence of buying by railroads has slowed demand. Pittsburgh makers have felt increasing requirements from jobbers, who are filling in stocks, but other buyers are not inquiring. Bolts and nuts continue 75 off list; large rivets are 2.25c, Pittsburgh, and 2.35c, Chicago. Talk is heard of an advance.

Ferroalloys Slower

Ferroalloy Prices, Page 44

Ferromanganese releases do not appear as heavy as they were just prior to the recent advance in the spot price from $61 to $68, eastern seaboard. Consumers laid in some stocks, but their requirements have continued to expand, and with prospects for still higher prices in the second half, they are continuing to specify a fair tonnage. Domestic spiegeleisen, 19 to 21 per cent is holding $24, furnace, for spot delivery.

Less Casting Capacity

American Iron and Steel institute, New York, reports steel castings capacity as of Dec. 31, 1932, as basic open-hearth, 776,400 gross tons; acid open-hearth, 662,190 tons; bessemer, 27,025 tons; electric, 525,580 tons; crucible, 1060 tons; making the total 1,992,255 gross tons. For the year previous, basic open-hearth was 789,700 tons, acid open-hearth, 678,190 tons; bessemer, 30,375 tons; electric, 540,890 tons; crucible, 1990 tons; making a total of 2,041,145 gross tons.

Eastern Rolling Mill Co., Baltimore, reports net loss in the first quarter of $65,887, which was less than the $113,957 loss in the fourth quarter of 1932 and the $169,751 loss in the first quarter of 1932.

Concrete Bars

Awards Increased by 2258 Tons for San Francisco-Oakland Bridge — Heavier Specifications Noted at Pittsburgh — Eastern Market Prices Are Firmer

REINFORCING BAR PRICES, PAGE 43

New York—The state is closing on highway and bridge contracts taking several hundred tons of mesh and bars. This is the first inquiry from that source in several months. Prices at 1.55c, cut lengths, Pittsburgh, have not been generally tested.

A large tonnage of concrete bars will be required for the Rip Van Winkle bridge across the Hudson river, Green-Columbia counties, New York, on which bids will be taken June 1.

Pittsburgh—Cut lengths of new billet steel bars hold at 1.55c, all basing points, and mill lengths are continuing 1.40c to distributors. Specifications have been heavy.

Chicago—Reinforcing bar inquiry shows occasional gains although projects are too small to build up any substantial tonnage for prospective business. Awards also are light, outstanding being 400 tons for a grain elevator for the Santa Fe railroad here.

Boston—Concrete reinforcing bar buying is in small lots and the number of such orders is not large. Prices are untested with rail steel bars 1.30c, eastern mill, and cut lengths of billet bars 1.55c, Buffalo.

Philadelphia—Despite dullness in the market, prices of reinforcing bars appear stronger at 1.55c, Pittsburgh, or 1.86c, Philadelphia, cut lengths, carlots. Leading sellers do not look for much improvement in road work and building construction until after June 1.

Contracts Placed

3000 tons, James river bridge, Richmond, Va., to Kalman Steel Corp., Bethlehem, Pa.; through S. M. Siesel Co., Milwaukee.

2258 tons, contracts Nos. 6 and 7, San Francisco-Oakland bridge, to Columbia Steel Co., San Francisco.

550 tons, Marine hospital, Staten Island, N. Y., to Milton Mfg. Co., Philadelphia.

500 tons, Pine Canyon dam, Pasadena, Calif., to Blue Diamond Co., Los Angeles.

400 tons, grain elevator, Chicago, Santa Fe railroad, to Inland Steel Co., Chicago.

400 tons, state road work in northern New Jersey, to Taylor-Davis Inc., Philadelphia.

200 tons, specification A 3187 Hoover dam, Boulder City, Nev., to Pacific Coast Steel Corp., San Francisco.

170 tons, Mt. Washington roadway work, Pittsburgh, divided between the Lind Co., and W. N. Dambach Inc., both of Pittsburgh; through Navarro Co., Oakmont, Pa., general contractor.

100 tons, Julian street bridge, San Jose, Calif., to Soule Steel Co., San Francisco.

Unstated tonnage, appraisers' store, Baltimore, to Kalman Steel Corp.; Bethlehem, Pa.; Pike & Cook Inc., Minneapolis, Minn., general contractor.

Unstated tonnage, public market buildings, Portland, Oreg., to Soule Steel Co., Portland; Ross B. Hammond, Portland, general contractor.

Concrete Awards Compared

	Tons
Week ended May 6	7,578
Week ended April 29	3,974
Week ended April 22	2,245
This week, 1932	2,454
Average weekly, 1932	3,929
Average weekly, 1933	3,419
Average weekly, April	2,169
Total to date, 1932	84,954
Total to date, 1933	64,961

Contracts Pending

2200 tons, contract No. 5, Yerba Buena island crossing, San Francisco-Oakland bridge, San Francisco. General contract to Clinton Construction Co., San Francisco.

1900 tns, contract No. 2, West Bay substructure, San Francisco-Oakland bridge, San Francisco. General contract to Transbay Construction Co., San Francisco.

1400 tons, contract No. 3, San Francisco anchorage, San Francisco-Oakland bridge, San Francisco. General contract to Healy-Tibbitts Construction Co., San Francisco.

1140 tons, contracts No. 4 and 4-A, East Bay substructure, San Francisco-Oakland bridge, San Francisco. General contract to Bridge Builders Inc., San Francisco.

743 tons, jail, San Francisco; bids rejected and new bids May 5.

305 tons, Panama; Jones & Laughlin Steel Corp., Pittsburgh, low on 285 tons; Bethlehem Steel Export Corp., low on 25 tons; bids May 2.

130 tons, bakery, Brooklyn, N. Y.

130 tons, cold storage plant, Mitchell Field, N. Y.

Pipe

Tubular Markets Quiet—Cast Pipe Makers Consider Advance —Connecticut to Buy 2100 Tons

PIPE PRICES, PAGE 43

Pittsburgh—Due to continued restrictions in building, and to difficulties in western oil fields the tubular products market is sharing only to slight extent in the general steel buying movement. Some activity is noted in mechanical tubing for the automotive and miscellaneous manufacturing trades.

Boston—For a Connecticut water line 2100 tons of 20-inch cast pipe will be purchased. New inquiry is lighter. Bids close May 16 on a fair tonnage of wrought, standard and small sized welded pipe for the navy yards at Boston, Newport and Portsmouth, N. H.

New York—Cast pipe for projects at Thiells, N. Y. and a sewer section, Westchester county, New York, have been placed, close to 400 tons. Inquiry except one for Stamford, Conn., calls for light tonnages. Foundries, in most instances are operating heavier, five days a week in at least one instance. Higher prices for pig iron and scrap are causing some consideration of an advance in cast pipe prices.

Cleveland—Pipe requirements here continue restricted by the low rate of building operations. Mills, however, note a slight gain in miscellaneous demand from jobbers.

Chicago—While cast pipe orders and inquiries recently have shown but little improvement, work in prospect is increasing steadily and release of projects under discussion would involve fairly heavy business. Several small projects in nearby states have been placed recently, most of which involve only small lots. Orders for soil pipe are heavier, part of which buying is attributed to the desire of distributors to build up depleted stocks. Cast pipe prices are receiving but little test.

Birmingham, Ala. — Cast pipe award are small. Shop operations average two to three days a week. Not much finished stock is being carried.

Cast Pipe Placed

600 tons, 8 to 12-inch, Leominster, Mass., to Warren Pipe Co., Boston. Previously reported as going to unstated foundry.

450 tons, pontoon and land pipe, Atlantic Gulf & Pacific Co., New York, to Lancaster Iron Works, Lancaster, Pa.

200 tons, 10 and 12-inch, section M, Hutchinson river sanitary sewer, New Rochelle, Westchester county, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.; Joseph di Gregory, Maspeth, L. I., general contractor.

177 tons, up to 20-inch, water line, state project, Thiells, N. Y., to unstated foundry.

Cast Pipe Pending

2100 tons, 20-inch, water line, Stamford to Greenwich, Conn.

1000 tons, 18-inch, Pittsburg, Calif.; project planned.

825 tons, 12 to 20-inch South Gate, Calif.; project planned.

328 tons, 12-inch Lynwood, Calif.; bids soon.

129 tons, 10-inch Pasadena, Calif.; bids soon.

175 tons, 6-inch, Lynn, Mass.; bids in.

100 tons, 12-inch, quartermaster, Fort Sill, Okla.; bids May 11.

Steel Pipe Pending

515 tons, ¾ to 3-inch black and ½ to 2-inch galvanized, Hoover dam, Boulder City, Nev.; bids opened.

200 tons, standard galvanized wrought iron or steel, 12-inch and under, also 6700 feet black extra strong wrought or steel, 6-inch and under, Panama; Youngstown Sheet & Tube Co., Youngstown, O., low on bulk of tonnage at $8956.24. Charles F. Guyon, New York, low on 6700 feet extra strong at $2527.98, delivered. Bids April 28.

Unstated tonnage 9170 feet, 3-inch and under standard, class A galvanized, bureau of supplies and accounts, navy department, Wash., for Boston, Philadelphia and Brooklyn; bids May 16.

Wrought Pipe Pending

250 tons, estimated, wrought and steel welded pipe and tubing, bureau of supplies and accounts, navy department, Washington; bids May 16, schedule No. 4.

Sheet Bars in Stronger Demand; Semi-Finished Firm

Semifinished Prices, Page 44

Demand for sheet bars has increased considerably as a result of expanding requirements from sheet and tin plate mills, but the market for billets and slabs is quiet. Some shipments of sheet bars are understood to have been made recently from an Ohio mill by vessel into the Detroit district. Sheet bars, billets and slabs are firm at $26, base, Pittsburgh, Youngstown, O., and Cleveland. Shipments of wire rods at $35, and forging billets at $31, have improved slightly.

Cold-Finished Is Firm

Cold Finished Prices, Page 43

Pittsburgh—The present base on cold-finished bars at 1.70c is held firmly and usual differentials for quantity and basing points are strong. Specifications from the automotive trade improve and many small buyers are in the market.

New York — The Keystone company has been awarded 100 tons, 45,000 feet of cold-drawn screw stock for Frankford arsenal, at 2.725c.

Coke

Heavy Tonnage Sale Reported At Buffalo—Prices Are Firm

Coke Prices, Page 44

Purchase by the American Radiator & Standard Sanitary Corp. from the Donner-Hanna Coke Corp., Buffalo, of an unstated tonnage of coke, reported as high as 100,000 tons, is the high spot of the fuel market this week.

Banking of a blast furnace stack at a Pittsburgh steelworks limits shipments of metallurgical coke there. Chicago producers find shipments of foundry coke following the upward movement of pig iron and increased foundry operations. In the St. Louis area April deliveries were the largest this year, with May continuing the increased rate. Heavy stocks at by-products plants at Birmingham, Ala., and light demand result in a sluggish market.

Prices show no change. At Chicago foundry coke for June delivery is $7 for outside delivery and $7.75 for Chicago delivery. Connellsville common brands of beehive foundry coke are $2.25, ovens, premium brands $4, ovens, and furnace coke about $1.75, ovens.

Ross-Meehan Continues

The Ross-Meehan Foundries, Chattanooga, Tenn., will continue operation of the business following the the death of G. F. Meehan, with the following staff of officers: F. M. Robbins, vice president and general manager; A. Lee Read, vice president in charge of sales; Henry Bond, secretary and treausrer.

Personals

(*Concluded from Page* 19)

with headquarters at the West Philadelphia, Pa., works. He succeeds J. W. Upp, who retired May 1 after 32 years with the company.

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F. H. Willcox has resigned as vice president of the Freyn Engineering Co., Chicago.

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W. H. Leonard, Denver, president, Gardner-Denver Co., is sailing for Johannesburg, South Africa, this month.

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Horace Hammond, president, Alabama By-Products Co. and Hammond Iron Co., Birmingham, Ala., is recuperating in Florida from a serious illness.

□ □ □

Herbert G. R. Bennett, assistant superintendent of the Youngstown, O., district bar mills of Carnegie Steel Co., Pittsburgh, has been named assistant general superintendent of the Duquesne works.

□ □ □

Fred Kennish, formerly superintendent of foundries, Stanley G. Flagg Co., Stowe, Pa., has been made foundry superintendent of the Thomas Devlin Mfg. Co., Burlington, N. J.

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John Smith has been transferred from the order department of the Inland Steel Co., at Chicago, to the company's office in the Fisher building, Detroit, which is in charge of J. H. Fitch, as district sales manager.

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L. H. States, formerly connected with the Philadelphia office of the Allis-Chalmers Mfg. Co., Milwaukee, has been transferred to Syracuse, N. Y. He will handle the principal products of the company for the central part of that state.

□ □ □

D. H. Locke, vice president and general manager of manufacturing, American Radiator Co., now also holds the same title for the Dominion Radiator & Boiler Co. Ltd., Toronto, Ont., the Canadian division of the American Radiator & Standard Sanitary Corp.

□ □ □

Donald B. Patterson, vice president, Harnischfeger Corp., Milwaukee, was elected chairman of the Electric Hoist Manufacturers' association at the sixteenth annual meeting in New York, April 26. He succeeds William White, secretary, Euclid-Armington Corp., Euclid, O.

Frank F. Seaman, general manager, hoist and crane division, Robbins & Myers Sales Inc., Springfield, O., was elected vice chairman. The next meeting of the association is to be held in New York about June 15.

□ □ □

C. E. Wright, markets and news editor of *The Iron Age*, has resigned to become associated with the New York office of the Republic Steel Corp., Youngstown, O. For 16 years he was identified with the Iron Age Publishing Co., being in charge of markets and news since 1930.

□ □ □

W. C. White, advertising manager, Aluminum Cooking Utensil Co., New Kensington, Pa., has been elected president and appointed a director of the company. Mr. White became affiliated with the Aluminum Co. of America, Pittsburgh, as advertising manager in December of 1928. In addition to these duties, he was appointed assistant to the president of the Aluminum Cooking Utensil Co. in May, 1931, and in October of the same year he was appointed general manager of the Aluminum Cooking Utensil Co., which position he has held until the present appointment. In addition to the presidency, Mr. White continues as advertising manager for the Aluminum Co. of America.

BUILT BY MORGAN *Engineering* » »

MORGAN Screw Type Ingot Stripper, stripping big end up ingots

THE Morgan Screw Type Stripper has been redesigned to strip three distinct types of ingots. 1. Big end up with hot top, illustrated. 2. Big end up with sink head. 3. Small end up or regular type. Several Morgan Strippers of this kind are in successful operation in leading steel plants where radical reductions in stripping time and less heat loss between ingot mold and soaking pit mean widening the margin between production costs and selling price. Full information regarding this improved Stripper will be furnished on request.

Morgan Products Include

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CONTRACTORS

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New York, 25 Broadway ALLIANCE, OHIO *Pittsburgh, 1420 Oliver Bldg.*

Scrap

Active Demand Makes Sharp Upturn in Prices—Malters Covering but Supply Small

Pittsburgh—In one of the most active weeks ever witnessed recently in the scrap market, No. 1 heavy melting steel advanced $1.50 a ton. Other grades were proportionately affected. This was due to sales at better than $12 in this district for No. 1 steel and also increasing bullish sentiment. Recent railroad lists include Baltimore & Ohio and Pennsylvania tonnages. The former was closed on at $12.05, but the latter, two days later, brought closer to $13 than $12. Specialties brought well over $13 on these lists. A sale of No. 2 steel was recorded late last week at $10.50 in this district and the same purchaser bought No. 1 steel within the market. Buyers and sellers are confused.

Cleveland—Scrap consumers in

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	6.50 to 7.00
Boston, dealers	4.50 to 5.00
Buffalo, No. 1	8.50 to 9.50
Buffalo, No. 2	7.00 to 8.00
Chicago	8.50 to 9.00
Cleve., No. 1	9.50 to 10.00
Cleve., No. 2	9.00 to 9.50
Det., No. 1 deal.	8.00 to 8.50
Det., No. 2 deal.	7.50 to 8.00
E. Pa. del. mill	8.00 to 8.50
E. Pa., No. 2 del.	5.50 to 6.00
Federal, Ill.	6.50 to 7.00
Granite City, Ill.	6.00 to 6.50
N. Y., deal, R. R.	6.00
N. Y. deal. No. 2	4.50
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	12.00 to 12.50
Pitts. No. 1 R. R.	12.50 to 13.00
St. L. No. 1 sel.	6.50 to 7.00
Valleys, No. 1	12.25 to 12.75

COMPRESSED SHEETS

Buffalo, dealers	7.00 to 8.00
Chi. (Factory)	6.50 to 7.00
Cleveland	9.50 to 10.00
Detroit, dealers	7.50 to 8.00
E. Pa. new mat.	6.50 to 7.00
Pittsburgh	11.00 to 11.50
Valleys	11.75 to 12.25

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cincinnati, del	4.75 to 5.25
Cleveland	6.50 to 7.00
Eastern, Pa.	5.50
Pittsburgh	10.00 to 10.50
St. Louis	3.00 to 3.50

SHEET CLIPPINGS LOOSE

Chicago	3.50 to 4.00
Cincinnati	3.00 to 3.50
Detroit, dealers	3.00 to 3.50
St. Louis	2.50 to 3.00

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	4.50 to 4.75
Buffalo	10.00 to 10.50
Chicago (3 ft.)	9.00 to 9.50
Chicago (2 ft.)	9.50 to 10.00
Cincinnati, del.	9.25 to 9.75
Detroit, deal.	10.50 to 11.00
Pitts. (open-hearth, 3 ft. and less)	12.50 to 13.00
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.50 to 6.00
Boston, dealers	2.00 to 2.50
Buffalo	8.00 to 8.50
Chicago, net	7.00 to 7.50
Cinci., deal. net	3.50 to 4.00
Det., net deal.	3.50 to 4.00
Eastern Pa.	6.00 to 6.50
N. Y., deal. mill	2.50 to 3.00
St. Louis	6.00 to 6.50

COUPLERS, SPRINGS

Buffalo	10.00 to 10.50
Chicago	9.00 to 9.50
Eastern Pa.	9.00
Pittsburgh	13.00 to 13.50
St. Louis	6.50 to 7.00

ANGLE BARS—STEEL

Chicago	8.50 to 9.00
St. Louis	5.75 to 6.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	9.00 to 9.50
Cleveland bil. and bloom crops	12.00 to 13.00
Eastern Pa.	10.00 to 10.50
Pittsburgh billet bloom crops	13.50 to 14.00
Pitts., sheet bar crops	13.50 to 14.00

FROGS, SWITCHES

Chicago	8.50 to 9.00
St. Louis	6.00 to 6.50

SHOVELING STEEL

Chicago	8.50 to 9.00
Cleveland	5.75 to 6.00
St. Louis	6.50 to 7.00

RAILROAD WROUGHT

Birmingham	6.50 to 7.00
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	5.50 to 6.00
Buffalo, No. 2	8.50 to 9.00
Chi., No. 1, net	7.00 to 7.50
Chicago, No. 2	8.50 to 9.00
Cinci., No. 2	6.50 to 7.00
Eastern Pa.	10.00 to 10.50
N. Y., No. 1, deal.	2.50 to 3.00
Pitts. No. 1	12.00 to 12.50
St. Louis, No. 1	4.25 to 4.75
St. Louis, No. 2	6.00 to 6.50

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	6.50 to 7.00
N. Y., deal.	3.25 to 3.75

BUSHELING

Buffalo, No. 1	7.00 to 7.50
Chicago, No. 1	6.50 to 7.00
Cinci., No. 1 deal.	4.50 to 5.00
Cinci., No. 2	2.75 to 3.00
Cleve., No. 2	6.50 to 7.00
Det., No. 1 new deal.	6.00 to 6.50
St. L., No. 1	3.50 to 4.00
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	1.75 to 2.00
Buffalo	4.00 to 4.50
Chicago	4.00 to 4.50
Cinci., deal.	3.75 to 4.25
Cleveland	5.00 to 5.50
Detroit	4.00 to 4.50
Eastern Pa.	3.50 to 4.00
N. Y., deal.	2.00 to 2.50
Pittsburgh	8.00 to 8.50
St. Louis	2.00 to 2.25
Valleys	6.75 to 7.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	0.75 to 0.90
Buffalo	4.00 to 4.25
Cinci., deal.	3.75 to 4.25
Cleveland	6.75 to 7.25
Detroit, deal.	5.50 to 6.00
Eastern Pa.	3.50 to 3.75
N. Y., deal.	2.00 to 2.50
Pittsburgh	6.50 to 7.00

CAST IRON BORINGS

Birming., chem.	8.50 to 9.50
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.00 to 4.25
Chicago	4.50 to 5.00
Cincin., deal.	3.75 to 4.25
Cleveland	6.75 to 7.25
Detroit, deal.	5.50 to 6.00
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.00
N. Y., deal.	2.00 to 2.50
Pittsburgh	6.50 to 7.00
St. Louis	2.50 to 3.00

PIPE AND FLUES

Cinci., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.50 to 5.00
Chicago, net	6.00 to 6.50
Cincinnati	4.50 to 5.00
Eastern Pa.	5.50 to 6.00
N. Y., deal.	4.00 to 4.50
St. Louis	5.00 to 5.50

FORGE FLASHINGS

Boston, dealers	3.00 to 3.25
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	8.25 to 8.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	9.50 to 10.00
Eastern Pa., del.	6.00 to 6.50

ARCH BARS, TRANSOMS

Chicago, net	7.00 to 7.50
St. Louis	4.00 to 4.25

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.00 to 6.25
Chi., elec. fce	6.50 to 7.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	6.50 to 7.50
St. Louis	3.50 to 4.00

STEEL CAR AXLES

Birmingham	9.00 to 10.00
Boston, ship. pt.	7.00 to 7.50
Buffalo	10.00 to 10.50
Chicago, net	10.50 to 11.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship. pt.	6.00 to 6.50
Eastern Pa.	12.00 to 13.00
N. Y., deal.	7.00 to 7.50
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	4.25 to 4.50
Buffalo, iron	7.00 to 8.00
Buffalo, steel	9.50 to 10.00
Chicago, iron	9.50 to 10.00
Chi., rolled steel	9.50 to 10.00
Cincinnati iron	6.25 to 6.75
E. Pa. iron	9.00
E. Pa. steel	9.00
Pitts., iron	10.50 to 11.00
Pitts., steel	12.00 to 12.50
St. Louis, iron	5.50 to 6.00
St. Louis, steel	6.25 to 6.75

NO. 1 CAST SCRAP

Birmingham	7.50 to 8.00
Boston, No. 2	3.00 to 3.25
Boston, textile	6.00 to 6.25
Buffalo, cupola	9.25 to 9.75
Buffalo (mach.)	9.75 to 10.25
Chicago, agri., net	7.00 to 7.50
Chi., mach. net	8.50 to 9.00
Chi., railroad net	8.00 to 8.50
Cinci., mach. cup	6.75 to 7.25
Cleve. cupola	8.50 to 9.50
Det., net deal.	7.00 to 7.50
E. Pa. cupola	9.00 to 10.00
N. Y., cup, deal.	5.50 to 6.00
N. Y., del. local foundries	8.00 to 8.50
Pitts., cupola	10.50 to 11.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1	6.00 to 6.50
St. L. No. 1 mach.	6.50 to 7.00

HEAVY CAST

Boston, del.	4.25 to 4.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto net deal.	9.00 to 9.50
Det. break., deal.	6.00 to 6.50
Eastern Pa.	9.00 to 9.50
N. Y. No. 1, deal.	5.50 to 6.00
N. Y. break, deal.	4.75 to 5.25
Pittsburgh	9.00 to 9.50

MALLEABLE

Boston, consum.	6.75 to 7.25
Buffalo	9.50 to 10.00
Chicago, agri.	6.50 to 7.00
Chicago, R. R.	9.00 to 9.50
Cinci., agri. del.	6.50 to 7.00
Cinci., R. R., del.	7.00 to 7.50
Cleveland, rail	10.00 to 10.50
Det. auto deal.	6.00 to 6.50
St. Louis	5.25 to 5.75

RAILS FOR ROLLING

5 feet and over

Birmingham	7.00 to 8.00
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	10.00 to 10.50
Eastern Pa.	9.50
New York dealer	4.50 to 5.00
St. Louis	7.50 to 8.00

LOCOMOTIVE TIRES

Chicago, cut	8.50 to 9.00
St. L., No. 1	5.50 to 6.00

LOW PHOS. PUNCHINGS

Buffalo	9.50 to 10.00
Chicago	10.00 to 10.50
Eastern Pa.	9.00
Pittsburgh	13.00 to 13.50

outlying districts are making inroads upon stock piles of local scrap producers. Quotations have jumped here by $1 to $3.25 a ton. Even carwheels, somnolent for months, have sold in large lots at $3.25 a ton higher than the last sale. Railroad malleable is up $2.00 a ton and short rails $2.25.

Sale of No. 1 heavy melting steel has just been made to a valley consumer at $12.50, and two important valley consumers still are expected to enter the market shortly for heavy melting.

Chicago—Scrap prices increased sharply the past week, the sale of a substantial tonnage of heavy melting steel having been made to a local mill at approximately $9, delivered, an advance of $1 since a week ago, with quotations on other grades also higher. While the recent advance, amounting to $3.50 since March, has resulted in a moderate increase in offerings, large tonnages still are not available.

Boston—Sharp advances in all grades of active scrap accompanies a better domestic demand. Heavy melting steel is $1 a ton higher, while skelton steel, yard steel, scrap rails, forge flashings, heavy and No. 2 cast and car wheels have advanced 50 cents to $1. While new export business has declined some buying against old orders continues, also for moderate water shipments to eastern Pennsylvania. Recent strength in machine shop turnings, long the lowest price grade continues with dealers offering $1.75 to $2.00.

New York—Sweeping advances in practically all grades of scrap from 50 cents to $1 a ton, cover some grades nominal for months, including borings and turnings. Higher prices for No. 1 and No. 2 scrap for domestic delivery have forced dealers to raise offers 50 cents on these grades for export, pegging the price for boat loading, dealers having considerable tonnage yet to fill against export. All cast scrap is firmer and No. 1 machinery cast for local foundry delivery is also stronger.

Weirton Steel Co. has bought 20,000 tons of scrap from the Lehigh Valley, including a substantial tonnage of old rails.

Philadelphia — Further advances are noted in the local scrap market. Bethlehem Steel Co. has closed on a small tonnage of No. 1 steel for its Sparrows Point, Md., plant at $6.50, delivered, a figure that is comparable to the market here. This is the first lot of this material purchased for Sparrows Point in several months. Export demand has subsided following the recent departure hereof a cargo of No. 1 steel for Japan. Supplies of No. 1 and No. 2 heavy melting steel in this district have reached the lowest point in a long time, due in no small measure to the export buying of the past three or four months.

Buffalo—Scrap dealers have advanced asking prices. The quotations are in some cases $2 to $3 higher than those made during first quarter.

Cincinnati—Iron and steel scrap grows progressively stronger, modest advances in prices failing to bring out adequate scrap for persistent demand of mills which are on better production schedules and working on reserves. Heavy melting steel is quoted 50 cents higher.

Detroit—Only stove plate, No. 2 old busheling and No. 1 machinery cast have failed to participate in a further upward movement in prices, which has lifted No. 1 melting steel to $8 to $8.50, compressed sheets to $7.50 to $8, and other grades in proportion. Consumer demand from outside the district continues insistent. There are evidences that the market will go still higher.

The Grant Iron & Metal Co. has chartered the self-unloading steamer LAGONDA and is negotiating for the INCA for the movement, until July 1 or longer, of scrap from Lake Superior and Lake Michigan ports to Cleveland, Pittsburgh, Youngstown and Canton. The company has purchased over 25,000 tons, mostly open-hearth grades, in the upper lake district.

St. Louis—Prices of iron and steel scrap have recorded further gains on practically all grades. Heavy melting steel and steel specialties displayed relatively greatest strength, having been marked up 50 cents to $1.50 per ton. Cast grades also are strong. Even at the advances, dealers are slow to sell any considerable tonnages, due to scarcity of certain grades.

Birmingham, Ala.—Plenty of old material is available. Shipments are slow and only spot business is being handled. Prices are firm and unchanged.

Quasi-Arc Inc. is moving its headquarters from 11 West Forty-second street, New York, to New Brunswick, N. J., where it is equipping a plant for production of its patented electrodes.

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PHOENIX SERVICE: has come to mean a continuing interest in every roll we sell until its full life has been obtained.

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Our latest development, PHOENIXLOY, a uniformly hard roll, is giving service today in many flat rolling mills which only two years ago was thought impossible.

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Phoenix "A" Rolls
Phoenix "K" Rolls
Phoenix Tube Mill Rolls
Phoenix Chill Rolls
Phoenix Nickel Chill Rolls
Phoenix Steel Rolls
Phoenix Sand Rolls

PHOENIXLOY
(Uniformly Hard)

PITTSBURGH ROLLS CORPORATION

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Pig Iron

New Prices Meet Test; Look For Further Advances—Small-Lot Sales Gain in Firm Market

PIG IRON PRICES, PAGE 44

Pittsburgh—Still lacking sizable tonnage, the merchant iron market is encouraging from the standpoint of going prices. All new advanced prices have been tested at full quotations of $14.50 on basic, $15.50 on bessemer and $15 on malleable and foundry, all Pittsburgh district furnace. Many of these sales have been small but represent the full extent of buyers' needs now. A notable example was the sale of about 2000 tons of basic iron recently for Toronto, O., at the full basic price. The bessemer iron inquiry which A. M. Byers Co. circulated recently has not been closed on, nor has Edgewater Steel Co.'s smaller inquiry for basic iron. Iron foundries are among recent buyers. After being banked for two months, the Neville Island stack of Davison Coke & Iron Co. resumed blast late in April.

Cleveland—Approximately 35 per cent of current pig iron shipments from lake furnaces are for automotive requirements, the proportion being smaller than generally supposed. The remainder is for general, miscellaneous purposes, with forwardings to stove foundries predominating. Improved demand is noted in some directions for malleable fittings. The most impressive feature at present, however, is the gain in consumption of steelworks grades. Sales of basic are noted at the new level of $14, base, valley, and another increase of 50 cents a ton is contemplated. Strength of the Cleveland price for outside delivery at $14.50, base, for foundry and malleable iron, is enabling other nearby furnaces to obtain better prices for these grades. For delivery in Cleveland, the market is firm at $15. Merchant sales by furnaces with headquarters here during the week totaled approximately 7000 tons, little changed from the preceding week. More inquiries are current.

Chicago—Orders show a further gain, with shipments also more active. April business was the heaviest in almost a year, while present indications point to the heaviest shipments since 1931. Automotive requirements still lead, but demand elsewhere is broadening. While price inflation fears are seen as responsible for some recent contracting, better shipments point to a definite gain in consumption. Price advances are anticipated shortly, in line with adjustments elsewhere.

Boston—Small-lot sales of pig iron are fairly numerous. The Whitinsville, Mass., textile machinery builder is reported in the market for about 1000 tons. Few large consumers have covered beyond a few weeks at present operations. Prices are firm, recent advances by several outside districts apparently holding, while Buffalo producers are taking a stronger stand for higher prices.

New York—While Buffalo producers have advanced prices on shipments into New England, they have not yet raised prices for this district, still quoting $14, base, furnace. However, silicon differential of 50 cents has been revived and with eastern Pennsylvania prices again higher, further upward revision in Buffalo quotations is expected. Meanwhile, foreign prices are advancing, as a partial reflection of higher foreign exchange. Notwithstanding, some sellers of foreign iron are disposed to quote for delivery into September. Bookings in this district appear slightly under a week ago. Demand has sifted down largely to requirements of jobbing foundries whose needs to date have increased but little. A leading inquiry involves 800 tons of various grades for the Elmira, N. Y., plant of General Electric Co.

Philadelphia — Further advances in eastern Pennsylvania prices have forced in an increased volume of business. The advances amounted to $1 increase in the base price of foundry iron and an increase of 25 cents in the silicon differential, restoring the old differential of 50 cents. No. 2 plain, consequently, is now $15.26, delivered Philadelphia; No. 2X, $15.76; and No. 1X, $16.26. Basic is up $1 to $15 to $15.25, delivered, eastern Pennsylvania, and eastern Pennsylvania malleable to $16.13, delivered. Copper-bearing low phosphorus advanced $1.50 to $22 to $23, eastern Pennsylvania furnace. Foreign foundry iron has been advancing consistently, reflecting higher foreign exchange.

Cincinnati—Consumers of northern pig iron are being warned of a possible price advance soon. Sales during the past week of over 1000 tons showed recent quotations firm. Shipments are moderately better against old contracts. Demand for southern iron is dull. A few carloads of silvery were bought before the advance of $1 last week. At least three inquiries for undisclosed tonnages of foundry iron are current.

St. Louis—A further moderate gain in the melt of pig iron is noted, and the market continues firm, with inquiry the largest in weeks. More activity prevails at stove and heating apparatus plants and with concerns manufacturing air-conditioning apparatus. Generally, the feeling pre-

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vails that prices will move upward, both for raw and finished materials. Several jobbing foundries have withdrawn prices made on castings in April. Preliminary reports indicate that total deliveries of pig iron to melters in this area in April were the largest since early in 1932. The backward spot continues to be basic iron.

Birmingham, Ala.—Spot business shows little change, with no extended orders reported. Shipments exceed production. Republic Steel Corp. No. 2 blast furnace at Thomas is being stepped up 400 tons daily. Base price of $12, f.o.b. furnace, is maintained.

Mirrors of Motordom

(*Concluded from Page* 17)

and for crates for export shipments, the automobile industry is reported to be paying a higher price. One manufacturer is operating too close for comfort in regard to malleable iron and cloth.

In May as in April, Chevrolet will make good its slogan, "Follow the leader." Its April production was just short of 60,000 units, and May will better this showing by 10 per cent.

Ford is holding at about 2500 units daily, 5 days a week, but has held up some steel releases. The report is insistent that further changes in personnel are being made. Some high officials have had their offices moved from the administration building into the plant.

Pontiac, whose final schedule for April was 8100 units, is operating still heavier; last week's schedule was 475 units, 5 days a week. Buick sales in April—about 5000 units—cut perceptibly into the inventory accumulated at Flint earlier in the year, largely to provide employment during the crisis. Cadillac-LaSalle has released some parts indicating a production of 500 units this month.

Chrysler is operating at higher schedules in all divisions. Plymouth is proceeding on a monthly basis of almost 25,000 units, while Dodge will do better than 8000. Total Chrysler production in May will be 40,000.

Hupp has been assembling 50 units a day, 5 days a week. Hupp, incidentally, is the manufacturer noted last week as exploring the possibilities of the low-price field. Its plans are in a very preliminary state, and there is no certainty that they will mature.

Hudson-Essex, also on a 5-day week, may top the 5000 mark this month. A new Terraplane six, slightly larger and in effect a de luxe companion to the present six, will be announced May 15. This new model will not displace either the present Terraplane six or eight, but will feature Terraplane characteristics in a larger chassis.

Hudson-Essex sales in April exceeded those of April, 1932, by 34 per cent. The last three weeks of April were 82 per cent better than the preceding three weeks.

Heartening as the present situation is in Detroit, there are some automobile executives who maintain that the present improvement is not recovery. There can be no recovery, they insist, so long as nearly 10,000,000 men are unemployed, or with wages so low. Increased grain and cotton prices, they believe, have accrued largely to middlemen and only in small measure to actual farmers.

The present flurry, these executives contend, is merely a rebound from the extreme low of the depression in March. Genuine recovery will not come before 1934, with an automobile output double 1933, they predict. In the first four months of 1933, production was approximately 540,000 units. The latter part of the year admittedly will be better than the first. This would indicate a 1933 total of upward of 1,500,000 units, making 1934 a 3,000,000-car year on the basis of these forecasts.

Some executives also believe that automobile demand has snapped back too rapidly, one of these defining his position as that of an "emotional optimist but a logical pessimist."

Fast as automobile activity has accelerated, it is slow compared with the recovery in rumors—"authentic rumors," as Detroit puts it—concerning General Motors and Ford.

Merely to relay what is common report in Detroit the past week, one rumor has Buick production about to be consolidated with Cadillac in Detroit, another rumor has Olds moving from Lansing in with Cadillac, while a third consolidates Buick and Olds production at Flint.

General Motors officials state that they have no knowledge of these impending changes. The only outward manifestation is the recent razing of some old buildings in the Buick group at Flint, and some adjustments in the Olds engineering staff.

Rumors concerning Ford deal chiefly with a reported sale of the steelworks at Fordson and a possible return to the Highland Park plant. Two large eastern steel interests are variously reported to have acquired not only the steelworks but also a substantial portion of adjacent buildings in the Fordson plant.

A survey by Ford is said to have disclosed that a daily production of 8000 to 10,000 units is required for profitable operation of the Fordson plant, and this market not being in immediate view, assembling will be transferred to Highland Park. There is nothing official to substantiate these reports, although they have gained wide currency.

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Warehouse

Sheet Concessions Erased; Steady Gain in Sales;

Pittsburgh—Prices on galvanized black and blue annealed sheets out of warehouse have been affirmed at minimums, thus eliminating some wide concessions. For over 25 bundles, black sheets are now quoted 3.00c, galvanized 3.35c and blue annealed 2.35c, all in-town Pittsburgh delivery. Under 25 bundles, black sheets are quoted 3.25c, galvanized 3.60c and No. 10 gage blue annealed 2.60c. Other warehouse prices are unchanged.

New York—Broader and slightly heavier demand for steel out of warehouse, which started late last month, continues with prices generally steadier. Cold-finished sheets have been marked up slightly.

Cleveland—No. 10 gage blue annealed sheets have been reduced by a leading warehouse from 3.00c to 2.75c. In line with the new card of extras mills recently issued on hot-rolled and hot-rolled annealed sheets, the warehouse now is quoting No. 8 gage the same as No. 10. The market is quiet.

Chicago—Sales are improving slowly but consistently, with April business substantially ahead of March. Building activity is providing little business but bars are moving well. Sheet prices are unchanged following recent mill revisions.

Philadelphia—A moderate increase is noted in jobbing demand. No. 10 blue annealed sheets have been reduced $4 a ton to 2.50c, reflecting competition with hot-rolled pickled and oiled sheets. Prices otherwise are unchanged.

Detroit—Warehouse demand for iron and steel continues to make moderate but steady advances. This is the more encouraging because it is the off season for tool and die work and conveyor system work contingent upon new models. There are signs that automotive manufacturing activity is approaching the point of some emergency buying.

Cincinnati—Warehouse inquiry has increased sharply, giving a bright outlook for May tonnage, although orders so far have been only slightly improved over April.

St. Louis—Sales of iron and steel from store are well sustained, with brewing needs still prominent. April sales showed a substantial gain over March and compared favorably with a year ago.

Gravel Fluorspar Up

Fluorspar Prices, Page 44

Chicago—Gravel fluorspar has advanced $1 a ton to $11.50, Kentucky and Illinois mines, for carload lots of the 85-5 per cent grade. This price is being quoted only for this quarter, and some producers are out of the market with their output for several months under contract.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS	☐
Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.50c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.50c-2.60c
Portland	3.00c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	☐
Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS	☐
Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.50c-2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	☐
Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES	☐
Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	☐
Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.10c-3.25c
Chattanooga	3.44c
Chicago	2.75c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.80c
New Orleans	3.25c
New York	2.75c
Portland	4.00c
Phila.*† (e)	2.50c
Pitts.**	2.60c
San Fran.	3.75c
Seattle	3.50c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	☐
Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.50c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.20c
New York	3.25c
Phila.*† (e)	3.15c
Pitts.**	3.35c
Portland	4.50c
San Fran.	3.70c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	☐
Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.00c
Chattanooga	3.95c
Chicago	3.25c-3.50c

††Base 15,000 lbs., extras on less.

Cincinnati	3.55c
Cleveland	3.50c
Detroit	3.50c
Houston	3.57c
Los Ang.	4.50c
New Orleans	**3.95c**
New York	3.50c
Phila.*† (e)	3.60c
Pitts.**	3.60c-3.85c
Portland	5.00c
San Fran.	4.30c
Seattle	4.75c
St. Louis	3.75c
St. Paul	4.19c
Tulsa	5.10c

†BANDS	☐
Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	2.75c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS	☐
Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL	☐
Baltimore (c)	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang.	5.50c
New Orleans	4.25c
Philadelphia	3.35c
Pittsburgh	2.95c
Portland (f)	4.50c
San Fran.(d)	5.50c
Seattle (f)	4.50c
St. Paul	3.20c
St. Louis	3.36c
Tulsa	4.65c

COLD ROLL. STRIP	☐
Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

Pacific Coast

Columbia Steel Co. Awarded 144,128 Tons for Oakland Bridge, Largest Tonnage Ever Placed on Coast—Seattle Has Bids on Large Pipe Line—Other Building in Prospect

San Francisco—(*By Air Mail*)—The largest structural shape award ever placed on the Pacific coast went to the Columbia Steel Co., United States Steel Corp. subsidiary, April 28, a total of 144,128 tons of various forms of steel for the West and East Bay superstructures and cables and attachments for the suspension portion of the San Francisco-Oakland bridge. The contract price was $22,530,567.

The general contracts for four additional divisions, involving 11,613 tons of steel at a total cost of $14,310,746 were also placed and it is expected the sub-contracts for the steel under these portions will be let within a short time.

The trade, both steel mill representatives and distributors, report April business being the best for any month this year. Prices appear to be on a firmer basis with the exception of plates, which are now being quoted at 1.75c, c.i.f.

Awards of reinforcing steel were the largest of any week during the past half year. The Columbia Steel Co. booked 1100 and 1058 tons, respectively, for the east and west bay superstructures of the San Francisco-Oakland bridge. Blue Diamond Co. took 500 tons for the Pine Canyon dam, Pasedena, Calif., and Pacific Coast Steel Corp. booked 200 tons for the Hoover dam project. Pending business includes 6640 tons for four portions of the San Francisco-Oakland bridge, the general contracts which have been let. New bids will be taken May 5 for 743 tons for the county jail at San Francisco.

New bids will be opened May 5 for close to 2000 tons of shapes for the county jail at San Francisco. Standard shapes hold at 2.10c, c.i.f., with wide flange material 2.20c. Total structural sales for the week were 116,560 tons.

Galvanized sheet prices have been advanced $2 a ton and are now quoted at 3.35c, c.i.f. Changes have recently been made in warehouse prices.

Seattle Jobs Are Bid

Seattle—Attention of the Pacific Northwest steel trade was centered this week on opening of bids for two Seattle municipal projects. For constructing 25,800 feet of 78-inch water pipe, replacing two wooden lines, 44 and 60-inch, tenders were received for various types. Puget Sound Machinery Depot, Seattle, was low on all proposals except reinforced concrete, on which Western Construction Co., Seattle, bid $448,765 for molded reinforced, and Coast Construction Co., Seattle, was low at $458,366 for centrifugally spun reinforced concrete. Puget Sound Machinery Depot was low on the following: Electrically welded steel, $322,304; welded steel, mortar covering, $373,323; creosoted wood stave, $284,722; combination of wood stave and welded steel, $288,779. If steel is used, 4850 tons of plates will be required. Action is pending. The figures are well below engineers' estimates.

Projected new construction includes a $200,000 quarantine station at Port Townsend, Wash., for the United States public health service. Bids will be called before July 1. Warrack Construction Co., Seattle, is low at $126,000 for a school at Fairbanks, Alaska, involving 131 tons of rein-

(*Please turn to Page* 60)

Steel in Europe

Continent Forms Six Cartels; Britain Sees Better Exports

London—(*By Cable*)—Pig iron producers in the Middlesbrough district are making concessions in price for export. Steelworks are more active in the Midlands but the outlook is uncertain. Trading with the Continent has been reduced to a minimum. Galvanized sheets show little life. Trade agreements with Scandinavia give hope of increased steel exports.

The Continent reports six international selling syndicates have been formed for two years, covering semi-finished, structurals, merchant bars, sheet bars, plates and medium sheets. General export trade by Continental producers still is quiet but prospects are improving and prices are hardening.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 4

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$11.44	2 18 6	$8.27	1 14 0
Basic bessemer	10.56	2 14 0*	6.81	1 8 0
Hematite, Phos. .03-.05	11.53	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.55	5 0 0	$10.71 to $10.95	2 4 0 to 2 5 0
Wire rods, No. 5 gage	29.33	7 10 0	$21.90	4 10 0
FINISHED STEEL				
Standard rails	$30.30	7 15 0	$26.77	5 10 0
Merchant bars	1.14c	6 10 0	.58c	2 13 6
Structural shapes	1.29c	7 7 6	.53c	2 8 6
Plates, †¼ in. or 5 mm	1.44c	8 5 0	.78c	3 12 6
Sheets, black, 24 gage or 0.5 mm.	1.49c	8 10 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	1.84c	10 10 0	1.46c	6 12 6
Bands and strips	1.36c	7 15 0	.83c	3 15 0
Plain wire, base	1.53c	8 15 0	1.18c	5 7 6
Galvanized wire, base	1.84c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.10c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 3.08	0 15 9	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$12.22	3 2 6*	$ 9.24	200	$ 9.57	290	$19.04	69
Basic bessemer pig iron	11.53	2 19 0*	7.85	170	7.26	220	20.84	75.50
Furnace coke	2.59	0 13 3	5.54	120	3.63	110	5.31	19.25
Billets	19.55	5 0 0	17.79	385	13.04	395	26.63	96.50
Standard rails	1.44c	8 5 0	1.46c	697	1.73c	1,150	1.65c	132
Merchant bars	1.18c	6 15 0	1.11c	530	.75c	500	1.38c	110
Structural shapes	1.53c	8 15 0	1.16c	550	.75c	500	1.34c	107.50
Plates, †¼-in. or 5 mm.	1.53c	8 15 0	1.43c	680	.98c	650	1.59c	127
Sheets, black	1.66c	9 10 0‡	1.79c	850‡	1.09c	725‡	1.80c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.06c	11 15 0	2.94c	1,400	2.10c	1,400	4.63c	370
Plain wire	1.53c	8 15 0	2.37c	1,130	1.95c	1,300	2.21c	177
Bands and strips	1.66c	9 10 0	1.05c	500	1.01c	675	1.59c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) dd. Middlebrough.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.50c, Conn., for copper

Sheets	
Yellow brass (high)	12.00
Copper, hot rolled	14.12½
Lead sheets, cut, to jobbers	7.25
Zinc sheets (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	13.75
Seamless copper	12.87½
Rods	
Yellow brass (high, full turning)	9.50
Naval brass	10.62½
Anodes	
Copper untrimmed	11.50
Wire	
Yellow brass (high)	12.00

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass	
New York	3.25 to 3.50
Chicago	3.12½ to 3.62½
Cleveland	3.75 to 4.25
St. Louis	3.00
Heavy Yellow Brass	
New York	2.50 to 2.62½
Heavy Copper and Wire	
New York	4.50 to 4.75
Chicago, No. 1	4.37½ to 4.62½
Cleveland	4.00 to 4.50
St. Louis	3.50
Composition Brass Borings	
New York	2.75 to 3.00
Yellow Brass Tubing	
Cleveland	3.00 to 3.50
Light Copper	
New York	3.50 to 3.75
Chicago	3.12½ to 3.62½
Cleveland	3.50 to 4.00
St. Louis	3.25
Light Brass	
Chicago	1.75 to 2.00
Cleveland	2.00 to 2.50
St. Louis	2.00
Lead	
New York	2.37½ to 2.50
Cleveland	2.25 to 2.50
Chicago	2.00 to 2.25
St. Louis	2.00 to 2.50
Zinc	
New York	1.50 to 1.62½
Cleveland	1.37½ to 1.50
Chicago	1.75 to 1.87½
St. Louis	1.50 to 1.75
Aluminum	
Clippings, new, soft, Cleve.	10.00 to 11.00
Clippings, hard, Cleveland	7.00 to 8.00
Borings, Cleveland	3.00 to 4.00
Mixed cast, Cleveland	5.25 to 5.75
Mixed cast, St. Louis	4.75 to 5.00

Secondary Metals

Brass ingot, 85-5-5-5	6.50
Remelt aluminum No. 12	9.00 to 10.00

Metals

Further Upward Tendency Is Shown with Tin Highest in Three Years—Copper 6.75c

New York—A further upward tendency developed in the nonferrous metal market last week with electrolytic copper pushing to 6.75c, Connecticut, and Straits tin rising to the highest level in more than three years. Zinc firmed up following previous easiness. Lead held firm with demand the most active of any of the metals. Antimony was firm but quiet. Nickel and aluminum held unchanged.

Copper—Both mining producers and custom smelters were asking 6.75c. Connecticut, for electrolytic copper near the close of the week. Previously the metal had sold at both 6.50c and 6.75c, and could be had for delivery through September. The advance in copper reflected to a large extent the tendency toward inflation and plans for curtailment of production this summer. Demand could be called no better than fair. Production probably will be cut to 10,000 tons per month or less this summer, compared with consumption of around two to two and a half times this amount. Stocks therefore should show a considerable reduction. Copper and brass products were advanced ¼-cent. Scrap also went higher.

Lead—Prices held steady at 3.50c, New York and 3.37½c, East St. Louis. Demand was in good volume for delivery through June from a diversified list of consumers. Sales for most companies balanced ore intake and further curtailment is anticipated this summer.

Zinc — The metal was easier through the major portion of the week, but regained firmness towards the close of the period with most sellers asking 3.75c, East St. Louis.

Antimony — Demand was quiet with spot generally bringing 6.25c, duty paid.

Tin — Straits metal jumped to above 34.00c late in the week as prices continued to climb on the London Metal exchange, accompanied by still higher rates on the pound Sterling. Buying was in fair volume. Tin plate makers are accounting for an increased proportion of the metal consumed.

Aluminum—Virgin metal was fairly steady with buying light. Remelt continued strong as scrap grew more scarce and higher.

By-Products More Active

New York—Napthalene shipments are seasonally active, with specifications in good volume, and a fair amount of spot buying. Prices are firm. Sulphate of ammonia also is moving well, while distillates show slight gains.

Coke By-Products

	Spot
Per Gallon Producers' Plants, Tank Lots	
Pure benzol	$0.32
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants	
Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.15

Quicksilver Firm

New York — Quicksilver prices are firm, small lots being quoted $57 a virgin flask of 76 pounds. Round lots are $56 to $56.50 a flask. Demand is fairly active.

Louis H. Rothschild, dealer in steel products, has moved from the May building to 1209 Empire building, Pittsburgh.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin New York		Lead	Lead East	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	N. Y.	St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
April 29	6.50	6.87½	6.25	31.12½	31.37½	3.50	3.37½	3.70	*22.90	6.12½	35.00
May 1	6.50	6.87½	6.25	32.37½	32.75	3.50	3.37½	3.75	*22.90	6.25	35.00
May 2	6.50	6.87½	6.25	32.37½	32.75	3.50	3.37½	3.75	*22.90	6.25	35.00
May 3	6.50	6.87½	6.25	32.87½	33.12½	3.50	3.37½	3.70	*22.90	6.25	35.00
May 4	6.50	6.62½	6.25	33.62½	33.87½	3.50	3.37½	3.70	*22.90	6.25	35.00
May 5	6.75	6.87½	6.50	34.62½	35.00	3.50	3.37½	3.70	*22.90	6.25	35.00

*Nominal quotation. Market range 18.90c to 22.90c.

Iron Ore for Centuries In Mesabi Range

(*Continued from Page* 14)

the quantity of high-grade ore that can be mined or manufactured from each of the three classes of iron-bearing material on the Mesabi range. The size of the ore piles represents the tonnage that they originally contained, the white portion being the quantity that has been mined, and the shaded portion the tonnage remaining in the ground.

The tonnage of the Class 1, or high-grade ore, is very accurately known, as previously explained. But the tonnages of Class 2 and Class 3 ores are not so accurately known, and as a matter of fact the tonnage in Class 3 may be very materially increased, because it has been computed for a depth of 400 feet only. By extending this depth, the quantity of Class 3 ore may be doubled.

It is evident that the Class 1 ore is a very small proportion of the total ore occurring on the Mesabi range, and it is also evident that the Class 1 ore has been about one-half used up, while the Class 2 and Class 3 ores have hardly been touched. Just how much longer the Class 1 ore will last depends, of course, upon how fast it is mined, but it is evident that the Class 2 and Class 3 ores together will last almost indefinitely.

The future reserves of the Mesabi range, therefore, lie largely in the Class 2 and Class 3 ores, and these materials must be utilized if the Mesabi is long to continue as an important iron mining district.

Class 1: High-Grade Direct Ore

The records of the Minnesota tax commission and the *Mining Directory of Minnesota* (published by the Minnesota School of Mines Experiment Station) supply the necessary information for tonnage estimates on the high-grade direct shipping ore. The reserve tonnage normally reported by the tax commission includes a certain amount of high-grade concentrate that can be made from Class 2 ore material.

In order to secure the desired figures on Class 1 ore, it is necessary to deduct from the tax commission figures the amount of concentrate that has been shipped and the amount remaining in the ground that is now included in the reserve tonnage estimates.

This leaves the tonnage indicated in the diagram, which represents only the high-grade direct shipping ore. From the diagram it is seen that if the same amount of Class 1 ore is mined in the next 20 years as was mined in the last twenty-years, the end of the high-grade ore will be definitely in sight, and the rate of mining will be on the decline.

Class 2: Partially Oxidized Ore

Tonnage estimates on this class of material were made by estimating the amount in each 40-acre tract along the range. Only those tracts known from the drilling and mining records to contain oxidized material were considered, and therefore, the tonnage of ore in this class may be somewhat greater than indicated on the diagram. All of this material must be concentrated and high-grade ore manufactured from it.

For each ton of Class 2 high-grade concentrate shown on the diagram, about two tons of ore material must be mined. One ton will be rejected as waste and the remaining ton will be the high-grade concentrate. The concentration methods used for rejecting the waste depend upon the exact nature of the material. About 25 per cent of the material in this class is of the type known as "wash ore," and a comparatively simple washing process is used to reject the waste. The remaining 75 per cent requires more elaborate concentrating processes, such as jigging, tabling, and possibly magnetic roasting.

From the diagram, it is evident that for the past 25 years Class 2 ore material has been utilized. Most of this material has been concentrated by the washing process, but in recent years a small amount of jig concentrate also has been made. Much attention has been given to methods for concentrating the Class 2 ore material, and comparatively simple processes are available by the use of which most of this material can be concentrated. At present only the washing process is generally accepted as being economically successful. The indications are, however, that the jigging process will be in quite general use within the next few years.

Class 3: Unaltered Iron Formation

The Class 3 material constitutes by far the greatest tonnage on the Mesabi range. Many samples have been drilled from the various horizons that make up the iron formation, and careful metallurgical tests have been conducted. The tonnage estimates were figured by use of the cross sections reported in *Bulletin No.* 19 of the Minnesota Geological Survey, by Prof. J. W. Gruner.

All of this material is low-grade, and for each ton of Class 3 high-grade concentrate shown in the diagram, three tons of the formation must be mined and two tons discarded as waste. The exact method by which this waste can best be discarded depends upon the nature of the material, but it seems now that a combination of tabling and magnetic concentration will be most successful.

On the eastern end of the range the iron oxide is largely in the magnetic state, and a large magnetic concentration plant was constructed at Babbitt which definitely demonstrated the possibility of manufacturing high-grade ore from the unaltered formation, although economically the operation has not been successful.

Further west on the range the formation contains more nonmagnetic oxide, but tabling, roasting, and magnetic concentration may be used to produce high-grade ore from nearly all of the formation.

Experimental work is constantly being carried on, and by the time the Class 3 ore is needed as reserves by the steel companies, processes undoubtedly will be available by which this material may be concentrated economically. The steel companies must be convinced of this, however, before they can acquire Class 3 material as ore reserves.

Conclusions

Although tonnage estimates of the total concentrate that can be produced from Class 2 and Class 3 ore materials are only approximate, they are sufficiently accurate to justify certain definite conclusions:

1.—If all of the ore material existing on the Mesabi range can be utilized, there is sufficient to last many generations.

2.—The quantity of Class 1 ore is definitely limited and does not furnish sufficient reserve tonnage for all of the steel companies that now obtain ore from Minnesota.

3.—If these companies are to secure additional ore reserves on the Mesabi range they must utilize Class 2 and Class 3 ore materials.

4.—Part of Class 2 is being utilized economically at present, and this material, known as "wash ore," therefore, constitutes recognized ore reserves. A large part of the Class 2 material is not now considered as ore reserves, however, because the economics of the concentrating processes now in use have not been definitely determined.

5.—The state of Minnesota has established a definite policy of assisting in the development of means for the utilization of its low-grade ore, and sufficient progress has been made to justify the statement that practically all of the low-grade ore on the Mesabi can be concentrated into desirable high-grade products.

6.—From an economic viewpoint, little can be definitely stated at present, but improvements in methods of mining and concentration are constantly being made, and without much doubt operating costs eventually will be reduced to a point where the economic value of Class

2 and Class 3 ore materials can be demonstrated. However, the tax paid by the iron mining industry is a lage item of expense, and although existing tax laws were developed for Class 1 ores only, the same method of taxation must be applied to Class 2 and Class 3 ores. Professor Blakey proposes a new method for the taxation of the low-grade ores, and states "the *ad valorem* system of taxation and the extraordinary expenditures of iron range municipalities threaten to hinder the most economical utilization of low-grade ores and even to check their development in the future after the richer ores are removed. The substitution of a graduated tonnage tax for the *ad valorem* tax on ores containing less than 35 or 40 per cent iron is suggested for consideration."

7.—The necessity for definitely demonstrating, in the near future, the economic and technical possibility of utilizing Class 2 and Class 3 ore materials has been pointed out. The state of Minnesota is supporting the technical development of means for utilizing the low-grade ores, and it is suggested that it also assist in the economic development by modifying its tax laws. Professor Blakey states that it is very important to make "these changes now, before this enormous reserve of low-grade ore has taken on value and before vested interests, public and private, have become so great that the inauguration of a proper tax system will become very disturbing and difficult. It cannot be stressed too emphatically that policies for the future should not be delayed but should be made now."

Pacific Coast Markets

(*Concluded from Page* 57)

forcing. Soule Steel Co., Portland, Oreg., is furnishing an unstated tonnage of concrete bars for the new public market in that city, Ross B. Hammond, general contractor.

A. D. Belanger, Seattle, has the general contract for a $300,000 brewery plant at Tumwater, Wash. Steel Tank & Pipe Co., Portland, has been awarded contract for general repairs to the government dredge COL. P. S. MICHIE, for which new boilers have been built by C. C. Moore & Co., San Francisco.

Hauser Construction Co., Portland, Oreg., general contractor for the government jetty at Newport, Oreg., has purchased two Superior diesel stationary engines and generators, also two Bucyrus diesel shovels, as well as compressors, dump cars and other equipment.

There is little activity in scrap. Steel mills are out of the market and exports await adjustment of exchange. General opinion here is that higher prices will rule and bring out ample supplies which have not moved because of unattractive quotation.

Equipment

Motorcar Releases and Navy Awards Stimulate East

New York—Spotty improvement in inquiry includes buying by an eastern truck manufacturer, mostly parts for changes following the booking of substantial orders for trucks. Automotive releases have stepped up operations for a Northern New Jersey ball bearing plant. Bulk of activity, however, comes from the navy department for which Pittsburgh Lectromelt Furnace Corp. is low on an electric melting steel furnace. General Electric Co. has been awarded contract for gun control equipment, as has the I-T-E Circuit Breaker Co.

Other low bidders on navy equipment include: Two lathes, Kemp Machinery Co.; milling machine and equipment, Kearney & Trecker Corp.; milling machine, Swind Machinery Co.; testing machine, Tinius Olsen Testing Machine Co.; turboblowers, American Blower Co.; 25 electric arc welding sets, Burke Electric Co. Recent navy awards include two lathes, Monarch Machine Tool Co.; and engine lathe, Sidney Machine Tool Co.

Worcester, Mass. — Brown & Sharpe Mfg. Co., Providence, R. I., is low on three automatic screw machines for naval station and the Bullard Co., Bridgeport, Conn., has been awarded a boring mill for the navy. Outside of government activity, demand for machinery and plant equipment is light, buying being limited as a rule to a few scattered units. Textile machinery builders have been fairly active on repairs and look for some improvement on new equipment soon. Ball bearing plant operations in southern New England, with one exception, show little change.

Westinghouse Electric & Mfg. Co. has bought some equipment for its Springfield, Mass., plant, including lathes and other machine tools.

Chicago—Improvement in activity in plant machinery and equipment is limited principally to inquiries, and these have gained only moderately. Dealers are hopeful of some pickup in purchases by railroads coincident with an improvement in traffic and the disposition of federal legislation with reference to the carriers. The Milwaukee road is closing on a wheel lathe and press. While steel mills have been making few purchases, some increased activity is expected in connection with new types of rolling and heat treating equipment.

Pittsburgh—Three large inquiries for extensive steel mill changes involving some heavy equipment work are being circulated. These are noteworthy in a rather quiet market considering the upturn in ingot operations and the apprehension which some steel producers must have regarded equipment that has been unused or made obsolete in the past few years. Recent activity has included some replacement parts for ten tin mills at the Shenango, Pa., mill of the American Sheet & Tin Plate Co. and also some revamping of the 8, 10 and 16-inch strip mills of the Superior Steel Corp., Carnegie, Pa.

Cleveland—Improvement in sales is spotty, with some lines of equipment showing good increases. A screw machine interest here reports sales of die heads good, with new machines moving slowly. This company is not covering on prices beyond immediate requirements, in contrast to some suppliers who on automotive business have covered through the fall. A steady and increasing demand for replacement needs is seen in many quarters as carrying the equipment market to the best levels in two or three years.

Steel Corporation Starts Earlier with Ore Movement

Iron Ore Prices, Page 44

Cleveland—Pittsburgh Steamship Co., Great Lakes subsidiary of the United States Steel Corp., started 15 of its iron ore carriers in commission last week. This interest did not start until July 1 last year, and then had only nine vessels in commission. Other interests also are more active, and the May tonnage is expected to show a good increase over that last year.

April shipments totaled 83,210 tons, clearances in the last few days of the month bringing the movement up considerably, according to current report from the Lake Superior Iron Ore association. In the month last year shipments amounted to 44,073 tons. The increase this year is 88.8 per cent. A special effort was made to move all the material possible before May 1, when ore in stock at the mines becomes subject to an extra tax. Prices for the season have not been determined.

R-S Products Corp., Philadelphia, has entered into an agreement with Ryan, Scully & Co., Philadelphia, whereby all products of the latter company will be manufactured, sold and installed by the former. G. F. Beach, chief engineer, and F. J. Ryan, president, of Ryan, Scully & Co., are associated in like positions with R-S Products Corp. The latter has taken over the leasehold of the plant at 4530 Germantown avenue, Philadelphia, previously controlled by Ryan, Scully & Co.

Construction and Enterprise

New England

WORCESTER, MASS. — Standard Mfg. Co. has been incorporated with 500 shares no par value to manufacture machinery, by Hugh W. Bacheller and Christine J. Bacheller, Watertown, Mass., and Margaret McLeod, Worcester, Mass.

New York

BATAVIA, N. Y.—City has appropriated $6000 for the purchase of electrically driven pumping equipment for the municipal waterworks plant.

BROOKLYN, N. Y.—Western Architectural Steel Inc. has been incorporated with $5000 capital to fabricate and erect steel and metal structures, by Oberlander & Oberlander, 32 Court street, Brooklyn, N. Y.

JAMESTOWN, N. Y.—City of Jamestown is considering erection of a large municipal garage and storage warehouse.

JAMAICA, N. Y.—Suburban Bronze Works Inc. has been incorporated with $3000 capital to operate a casting foundry, by Savarese & Seitz, 161 Jamaica avenue, Jamica, N. Y.

NEW YORK—Columbus Engineers Supply Co. Inc. has been incorporated with $1000 capital to supply building materials, by Frank B. York, 92 Liberty street, New York.

NEW YORK—Pan-American Petroleum & Transport Co., 122 East Forty-second street, plans construction of a refinery on the Texas gulf coast and has taken options on two sites. Pan-American is controlled by the Standard Oil Co. of Indiana and since sale of its foreign properties to the Standard Oil Co. of New Jersey it has been expanding domestic operations.

Pennsylvania

McKEES ROCKS, PA.—Enterprise Can Co. is building an addition 100 x 270 feet, two stories, to cost about $125,000. Austin Co., Cleveland, is general contractor.

WASHINGTON, PA.—Tygart Glass Co. has bought the warehouse of the Sidney-Topliff Co. to meet enlarged demand for its products.

Ohio

CIRCLEVILLE, O.—City council has approved hiring an engineer to report on possibilities of erection of a municipal electric light and power plant.

CLEVELAND — Willard Storage Battery Co. is building an addition to house its forming department, replacing an existing structure, at a cost of about $100,000.

LIMA, O.—Lima Sheet Metal Products Co. is enlarging its working force to meet demand for its metal refrigerators.

TOLEDO, O.—Amerian Metal Cap Co. has been incorporated to manufacture a new type screw cap for bottles and other containers, by Harry Levison, attorney, Toledo, O.

Michigan

DETROIT—Charles G. Spreen & Associates, 1040 Fort street west, are considering the manufacture of a new type of mechanical refrigerator. When plans are completed a plant may be sought for its production.

Indiana

ELKHART, IND.—Western Corp. has been incorporated with 1000 shares no par value to manufacture mechanical devices for handling coal, coke, grain and other materials, by William Roy Riblet, William H. Warford and Ruskin B. Phillips.

HUNTINGTON, IND.—Appropriation has been made of $2200 to hire engineering service to make a survey of the feasibility of building a municipal electric light and power plant or condemning and buying the plant of the Northern Indiana Power Co.

INDIANAPOLIS—Electric Devices Corp. has been incorporated with 90 shares no par value to manufacture electrical and mechanical devices, by Theodore A. Sperry, Richard C. Sperry and John Niven.

INDIANAPOLIS—Hydraulic Stokers Inc. has been incorporaed with $10,000 capital to manufacture stokers and heating devices, by Louis Schquitzer, Harry F. Bennett and Carl J. Winkler.

JONESBORO, IND.—Paranite Wire & Cable Co. has booked an order for 50 carloads of rubber-insulated wire, assuring capacity operations to July 3.

MICHIGAN CITY, IND.—Machinery and equipment of the H. W. Angsten Co., Carroll street and South Shore tracks, will be sold auction May 9 by Michael Tauber & Co., auctioneers. Company manufactured automobile and cycle equipment and sale will include machine tools, punch presses, motors, miscellaneous equipment, furnaces and small tools.

Illinois

CHICAGO—Standard Service & Burner Corp., 9120 Throop street, has been incorporated with $20,000 capital to manufacture oil burners, by Sidney Levy, 231 South LaSalle street, and associates.

ROCKFORD, ILL.—Rockford Supply & Equipment Co., 325 South Court street, has been incorporated with $20,000 capital to manufacture and rebuild machinery, by Loratta Laden, Ashton building, Rockford, Ill.

WAUKEGAN, ILL.—Diamond Scrap Yards Inc., 413 Market street, has been incorporated with $2000 capital to operate a scrap business, by Samuel and Louis Dulsky, 29 South La Salle street, Chicago.

Southern States

ANNISTON, ALA.—Kilby Car & Foundry Co. suffered a moderate fire loss in a recent blaze in its plant here.

NEW ORLEANS—Rogers Auto Service has been incorporated with $1000 capital by Shelby N. Rogers, president, to operate an automotive repair service.

Arkansas

EL DORADO, ARK.—Union Pipe & Supply Co. has been incorporated with $4800 capital by Frank Myrick and associates.

Oklahoma

OKLAHOMA CITY, OKLA.—Excelsior Mfg. Co. of Oklahoma has been incorporated with $450,000 capital to establish a branch stove manufacturing plant here. John J. Fisher, Quincy, Ill., is incorporator.

OKLAHOMA CITY, OKLA.—Macklanburg-Duncan Co. has started operation of a plant at 123 NW Twenty-third street to manufacture metal weatherstrip and solder. L. A. Macklanburg is president and manager.

TULSA, OKLA.—Sinclair-Prairie Pipe Line Co., Exchange Bank building, is removing its 140-mile, 12-inch oil pipe line between Oklahoma City, Okla., and Coffeyville, Kan., and will relay it from Mexia, Tex., to a point north of Houston, Tex., connecting with the Sinclair Refining Co.'s main line.

Minnesota

ST. PAUL, MINN.—Twin City Iron & Wire Co., 35 Water street, has occupied a two-story addition 40 x 70 feet as part of an expansion program to meet enlarged demands for its products, wire screens and specialties.

Kansas

WICHITA, KANS.—Fire damaged the plant of George C. Christopher & Son Iron Works.

Pacific Coast

OAKLAND, CALIF.—Acme Brass & Aluminum Foundry, 1125 Twenty-first street, has started operations on a general line of brass and aluminum castings. John M. Rae and Walter E. Spring are owners.

PASCO, WASH.—City council is considering authorization of a bond issue to finance a proposed filter plant water system, cost of which is estimated at $20,000 to $45,000.

Dominion of Canada

WINNIPEG, MAN.—Canadian Electric & Brass Co. Ltd. plans construction of a new factory, to cost about $50,000.

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